CONTRACT

SPECIAL PROVISIONS

CSI-Inch/Pound

Project No: SP-0040(51)81

Name: US-40 BRIDGES; STARVATION RES. & JENSEN BRIDGES

MINOR BRIDGE REHAB

County: DUCHESNE, UINTAH

Bid Opening: July 29, 2003

Date

MANDATORY PRE-BID CONFERENCE

Date: July 15, 2003

Time: 02:00 pm

Location: Downstairs Conference Rooms
UDOT, 658 North 1500 West
Orem, Utah

Conference attendance is a requirement for bid submission.

UDOT
GOING THE EXTRA MILE

2002 - U.S. Standard Units (Inch-Pound Units) June 3, 2003

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10. Section 02765S – Pavement Marking Paint
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13. Section 03921S – Parapet Surface Repair
14. Section 03934S – Structure Pothole Patching, Quick Set
15. Section 05831S – Joint Gland Replacement
16. Section 13592S – Roadway Weather Information System Environmental Sensor Station (RWIS-ESS)

I. 2002 Standard Specifications

The State of Utah Standard Specifications for Road and Bridge Construction, U.S. Standard Units (Inch Pound Units) CSI Format, Edition of 2002 with Changes One and Two included applies on this project as a static Specification Book.

Refer to Part II (List of Revised Standard Specifications) and Part XI (Special Provisions) for other project specific specifications.

II. List of Revised Standard Specifications

Change One – Included in 2002 Standard Specifications

Revised August 29, 2002

Section 00570 Articles 1.2 A 69, A 71 b (deleted)
Section 00727 Articles 1.1 D; 1.5 B; 1.9; 1.10; 1.16 B, C; 1.18 B
Section 01574 Articles 1.2 B
Section 02721 Articles 1.2 D (added), H (replaced), I (deleted);1.6 B1; 2.1 A Table 3; 3.2 C
Section 02741 Articles 3.8 E 2 a, b
Section 02821 Articles 3.1 A
Section 02892 Articles 1.5 A, B
Section 02936 Articles 1.4; 1.5 C
Section 03152 Articles 1.2 P, Q; 2.2 A, B
Section 05120 Articles 1.4 A (deleted), 3.3 A
Section 16525 Articles 1.6 A, B

Change Two – Included in 2002 Standard Specifications

Revised December 19, 2002

Section 01561 Article 3.1 A
Section 02075 Article 2.7 A
Section 02372 Article 2.1 A 4
Section 02455 Article 3.3 B 2
Section 02785 Article 3.2 C
Section 02861 Article 3.3 A
Section 03055 Articles 1.2 P (inserted), 2.3 B, 2.4 (deleted), 2.7 A 1 a-e (added), 2.7 B 2 (added), 2.8 A 1 a, 2.8 A 2 (deleted), 2.9 A3, 3.2 A Table, 3.2 C, 3.7 A 3, 3.8 C 1, 3.9 A-B, 3.10, 3.11 B 1, 3.11 B 3
Section 07922 Article 2.1 Table 1

Change Three

Revised February 27, 2003

Section 01355 Article 1.3 A 3
Section 01721 1.4 C deleted and moved to Measurement and Payment document
Section 02222 Changed title from Site Demolition-Pavement to Site Demolition - Concrete, A, 3.2 Title, 3.2 A
Section 02224 New Specification
Section 02316 1.2 A, D, I added, 1.3 added, 1.7 B, C, D, E, F, G added, 3.9 A added
Section 02455 3.3 B 2 (corrected error from change two)
Section 02721 1.2 Related Sections added, 1.3 H and I added, 1.7 B, 1.7 F deleted, 2.1 B added, 2.2 deleted, 3.1 Title changed, 3.2 B reference added, 3.2 E added
Section 02741 1.4 C6a added, 1.4 H, Table 3, 2.4 A, 2.4 C, Table 9, 2.5 B 1-3, 2.5 B 4 added, 2.5 D, 3.1 Al deleted, 3.2 C3 added, 3.7 D1, 3.9 B4, 3.9 B5 added, 3.9 E note added
Section 02744 Entire Section deleted
Section 02745 1.4 A9
Section 02785 1.2 C and D added
Section 02892 Added Articles, 1.3 N, O, Y, 1.5 D, 2.4 I, 2.5 C, D, E, 2.6 B3 - B6, 2.6 C, 2.16, 2.17, 3.11 and Revised Articles 3.5 F and Table Number, 3.5 G and Table Number
Section 02896 2.1 A, B and 3.1 A drawing number corrected
Section 16525 1.2 H

Change Four

Revised April 24, 2003

Section 00555 1.18 added Table 1
Section 01280 1.2 K
Section 01282 1.13 B added, 1.13 G 2 deleted
Section 02222 1.2 B Title Changed
Section 02231 3.5 A
Section 02705 Title Changed, 1.1 A, 1.3 added, 3.1 Title changed, 3.1 A, 3.1 D moved, 3.2 added
Section 02741 3.7 B
Section 02747 Entire Section deleted
Section 02752 1.8 E 1
Section 02753 3.1 D 5 a, 3.3 D
Section 02842 2.4A
Section 02861 2.1 I
Section 02911 3.2 A 1
Section 02931 3.2 B
Section 03392 2.1 A 8-9
Section 03921 2.1 A 1, 2.1 C
Section 03922 2.1 B 1-2
Section 03923 2.1 A-B, 3.1 B
Section 03924 2.2 A-B

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Section 03935 2.1 A, 2.1 A 2
Section 07105 2.3 A
Section 13553 1.2 C Title Changed
Section 13554 1.1 A, 1.3 C and D added, 2.1 A, 2.1 F, 2.2 D 1, 2.2 D 2 deleted, 2.2 E, 2.2 H, 2.2 H 2, 2.2 H 3 deleted and renumbered, 3.1 B 3 added, 3.1 I

III. List of Revised Standard Drawings

Change One

Revised December 19, 2002

AT 7	Polymer Concrete Junction Box Details	12/19/2002
BA 1A	Precast Concrete Full Barrier Standard Section	12/19/2002
BA 1B	Precast Concrete Full Barrier Standard Section	12/19/2002
BA 3	Cast In Place Constant Slope Barrier	12/19/2002
BA 4B	Beam Guardrail Installations	12/19/2002
BA 4C	Beam Guardrail Anchor Type I	12/19/2002
CC 6	Crash Cushion Type E Sand Barrel Details	12/19/2002
DG 3	Maximum Fill Height and End Sections for HDPE And PVC Pipes	12/19/2002
DG 4	Pipe Culverts Minimum Cover	12/19/2002
EN 4	Temporary Erosion Control (Drop-Inlet Barriers)	12/19/2002
GW 1	Raised Median and Plowable End Section	12/19/2002
PV 2	Pavement Approach Slab Details	12/19/2002
SL 13	Traffic Counting Loop Detector Details	12/19/2002
SN 2	Flashing School Sign	12/19/2002
SN 4	Flashing Stop Sign	12/19/2002
SN 5	Typical Installation For Milepost Signs	12/19/2002
SN 8	Ground Mounted Timber Sign Post (P1)	12/19/2002
ST 1	Object Marker “T” Intersection and Pavement Transition Guidance	12/19/2002
ST 7	Pavement Markings and Signs at Railroad Crossings	12/19/2002
SW 3A	Precast Concrete Noise Wall 1 of 2	12/19/2002
SW 3B	Precast Concrete Noise Wall 2 of 2	12/19/2002
SW 4A	Precast Concrete Retaining/Noise Wall 1 of 2	12/19/2002

Change Two

Revised February 27, 2003

GW 2	Concrete Curb and Gutter	02/27/2003
GW 5	Pedestrian Access	02/27/2003

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Change Three

Revised April 24, 2003

AT 7	Polymer-Concrete Junction Box Details	04/24/2003
CB 2	Curb Inlet Catch Basin	04/24/2003
CC 7	Grading & Installation Details Crash Cushion Type F	04/24/2003
CC 8	Grading & Installation Details Crash Cushion Type G	04/24/2003
CC 9A	Grading & Installation Details Crash Cushion Type H	04/24/2003 (New)
CC 9B	Grading & Installation Details Crash Cushion Type H	04/24/2003 (New)
EN 2	Temporary Erosion Control (Silt Fence)	04/24/2003
GW 2	Concrete Curb and Gutter	04/24/2003
SN 12B	Ground Mounted Sign Installation Details	04/24/2003

IV. Materials Minimum Sampling and Testing

Follow the requirements of the Current Materials Minimum Sampling and Testing Manual:

Materials Minimum Sampling and Testing Manual reference can be found from the UDOT Web Site at:
http://www.dot.utah.gov/esd/Manuals/Materials/MaterialsSampling.htm

For UDOT employees the Manual can also be found on the Shared Drive at:
\Shared\Engineering Services\Manuals\Materials (W drive for the Complex and R drive for the Regions)

V. Notice to Contractors

NOTICE TO CONTRACTORS

Sealed proposals will be received by the Utah Department of Transportation UDOT/DPS Building (4th Floor), 4501 South 2700 West, Salt Lake City, Utah. 84114-8220, until 2 o'clock p.m. Tuesday, July 29, 2003, and at that time the download process of bids from the USERTrust Vault to UDOT will begin, with the public opening of bids scheduled at 2:30 for MINOR BRIDGE REHAB of US-40 BRIDGES; STARVATION RES. & JENSEN BRIDGES in DUCHESNE, UINTAH Counties, the same being identified as State Project No: SP-0040(51)81.

Federal Regulations:
Wage Rate Non-Applicable.

Project Location: 0.4386 Miles of Route: 0040 from R.P. 081 to R.P. 159.1

The principal items of work are as follows (for all items of work see attachment):
Epoxy-Urethane Polymer Crack Treatment and Waterproofing Overlays for Bridge Decks
HMA - 3/4 inch (TLA Binder)
Structure Pothole Patching, Quick Set

The project is to be completed: in 25 Working Days.

Mandatory Pre-bid Conference: July 15, 2003, 02:00 pm, Downstairs Conference Rooms
UDOT, 658 North 1500 West
Orem, Utah

Conference attendance is a requirement for bid submission.

Other Requirements:
All project bidding information, including Specifications and Plans, can be viewed, downloaded, and printed from UDOT's Project Development Construction Bid Opening Information website, http://www.dot.utah.gov/cns/bidopeninfo.htm. To bid on UDOT projects, bidders must use UDOT's Electronic Bid System (EBS). The EBS software and EBS training schedules are also available on this website.

Project information can also be reviewed at the main office in Salt Lake City, its Region offices, and its District offices in Price, Richfield, and Cedar City.

Project Plans cannot be downloaded or printed from the website unless your company is registered with UDOT. Go to UDOT's website to register. Unregistered companies may obtain the Specifications and Plans from the main office, 4501 South 2700 West, Salt Lake City, (801) 965-4346, for a fee of $20.00, plus tax and mail charge, if applicable, none of which will be refunded.

Prequalification of bidders is required. Prior to submitting a bid, the bidder must have on file with the Utah Department of Transportation a completed and approved contractor's application for prequalification. Department processing time is 10 working days from receipt of properly executed documentation.

As required, a contractor's license must be obtained from the Utah Department of Commerce.

Each bidder must submit a bid bond from an approved surety company on forms provided by the Department; or in lieu thereof, cash, certified check, or cashier's check for not less than 5% of the total amount of the bid, made payable to the Utah Department of Transportation, showing evidence of good faith and a guarantee that if awarded the contract, the bidder will execute the contract and furnish the contract bonds as required.

The right to reject any or all bids is reserved.

If you need an accommodation under the Americans with Disabilities Act, contact the Construction Division at (801) 965-4346. Please allow three working days.

Additional information may be secured at the office of the Utah Department of Transportation, (801) 965-4346.

Dated this 28th day of June, 2003.

UTAH DEPARTMENT OF TRANSPORTATION
John R. Njord, Director

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VI. EQUAL OPPORTUNITY (STATE PROJECTS)

Selection of Subcontractors, Service Providers, Procurement of Materials and Leasing of Equipment:

Do not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

Notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. Use best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Obtain lists of DBE construction firms from SHA personnel.

Use best efforts to ensure subcontractor compliance with their EEO obligations.

Selection of Labor:

During the performance of this contract, do not discriminate against labor from any other State, possession, or territory of the United States.

Employment Practices:

During the performance of this contract, the Contractor agrees as follows:

Do not discriminate against any employee or applicant for employment because of race, religion, sex, color, national origin, age, or disability. Take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, sex, color, national origin, age, or disability. Such action includes, but is not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoffs or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Agree to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Department of Transportation setting forth the provisions of this nondiscrimination clause.

In all solicitations or advertisements for employees state that all qualified applicants receive consideration for employment without regard to race, religion, sex, color, national origin, age, or disability.

Send to each labor union or representative of workers that the Contractor has a collective bargaining agreement or other contract or understanding, a notice to be provided by the State Department of Transportation advising the said labor union or worker' representative of the commitments under this section and post copies of the notice in conspicuous places available to employees and applicants for employment.

In the event of noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further State contracts.

Include the provisions of this Section in every subcontract or purchase order so that such provision will be binding upon each Subcontractor or vendor. Take such action with respect to any subcontract or purchase order as the State Department of Transportation may direct as a means of enforcing such provisions including sanctions for noncompliance.

VII. Bidding Schedule

Utah Department of Transportation
Bidder's Schedule

Bid Opening Date: 7/29/2003
Region: REGION 3
Project Number: SP-0040(51)81
County DUCHESNE
Project Name: US-40 BRIDGES; STARVATION RES. & JENSEN BRIDGES
Description: MINOR BRIDGE REHAB
Funding STATE

#	Item	Description	Quantity	Unit
20 - STRUCTURES				
1	012850010	Mobilization	1	lump sum
2	01554000*	Traffic Control	1	lump sum
3	01557001*	Variable Message Sign	150	calendar day
4	01559008*	Temporary Traffic Signal	150	calendar day
5	02225000*	Asphalt Surfacing Removal (Structures)	3115	square yard
6	02741006P	HMA - 3/4 inch (TLA Binder)	350	ton
7	027480040	Emulsified Asphalt CSS-1	4	ton
8	027650060	Pavement Marking Paint	5250	foot
9	03371000*	Epoxy-Urethane Polymer Crack Treatment and Waterproofing Overlays for Bridge Decks	67310	square foot
10	03381000*	Clear Penetrating Concrete Sealer for Bridges	4840	foot
11	03921000*	Parapet Surface Repair	1700	foot
12	03934000*	Structure Pothole Patching, Quick Set	4210	square foot
13	05831000*	Joint Gland Replacement	46	foot
14	071050010	Waterproofing Membrane	28100	square foot
15	079220010	Relief Joint Crack Sealing	182	foot
70 - ATMS				
16	028210044	Chain Link Brace Post	4	each
17	02821004P	7 ft Chain Link Fence, Type IV, with Barbed Wire and Arm	34	foot
18	02821005P	Chain Link Gate, H= 6 ft X W= 5 ft	2	each
19	13553002P	2" Conduit, Schedule 40 PVC	800	foot
20	13553003P	1 1/2" Conduit, Schedule 40 PVC	10	foot
21	13554002P	Polymer Concrete Junction Box, Type I	1	each
22	13554003P	Polymer Concrete Junction Box, Type II	3	each
23	13592000*	Concrete Service Pad	1	lump sum

Note: Item numbers ending with "" or "P" identify a change to the Standard Specification, Supplemental Specifications or Measurement and payment. Read all related documents carefully.

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VIII. Measurement and Payment

MEASUREMENT AND PAYMENT
SP-0040(51)81

The Department will measure and pay for each bid item as detailed in this section. Payment is contingent upon acceptance by the Department.

Items are listed by Specification and in tables as follows:

Item #	Bid item number	Bid Item Name	Unit of measurement and payment
Additional information goes here.			

1	**012850010**	**Mobilization**	**Lump sum**
	Payment	**Amount Paid**	**When Paid**
	First	The lesser of 25% of Mobilization or 2.5% of contract	With first estimate
	Second	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 5% of contract
	Third	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 10% of contract
	Fourth	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 20% of contract
	Final	Amount bid in excess of 10% of contract price.	Project Acceptance-Final

2	**01554000***	**Traffic Control**	**Lump sum**
	Payment	**Amount Paid**	**When Paid**
	One	25% of the bid item amount	With first estimate
		Remaining portion of bid item paid as a percentage of the contract completed.	With each estimate

3	**01557001***	**Variable Message Sign**	**Cal. Day**
Includes all materials and workmanship to provide a fully operational Variable Message Sign System.			

4	01559008*	Temporary Traffic Signal	Cal. Day
Includes all materials and workmanship to provide a fully operational Temporary Traffic Signal. Four (4) signs required, two (2) for each structure.			

5	02225000*	Asphalt Surfacing Removal (Structures)	Square Yard

6	02741006P	HMA – ¾ inch (TLA Binder)	Ton
Includes aggregates, TLA asphalt binder, hydrated lime, other additives, etc. The Department will not pay separately for TLA asphalt binder, hydrated lime, additives, etc.			

7	027480040	Emulsified Asphalt CSS-1	Ton
Do not measure water added in excess of the specified amount in Standard Specification 02745.			

8	02765006	Pavement Marking Paint	Feet

In place, Payment:

A. The Department will not pay for removal of unauthorized, smeared, or damaged markings.

B. Price reduction for paint application rate:

Rate	Pay Factor
At the specified mil thickness	1.0
1-10 percent below the specified wet mil thickness	0.75
11-15 percent below the specified wet mil thickness	0.50
More than 15 percent below the specified wet mill thickness	Replace pavement markings.

9	03371000*	Epoxy-Urethane Polymer Crack Treatment and Waterproofing Overlays for Bridge Decks	Square Feet
The price will be full compensation for all work including, but not limited to, striping removal, pothole patching, shot-blasting, applying polymer overlay and aggregate. Structure No. C-560.			

10	03381000*	Clear Penetrating Concrete Sealer for Bridges	Feet
Of surface covered.			

11	**03921000***	**Parapet Surface Repair**	**Feet**
Additional compensation is not allowed for removing and repairing failed concrete patches. Replace barrier reflectors in kind.			

12	**03934000***	**Structure Pothole Patching, Quick Set**	**Square Feet**
Estimated plan quantities are based on preliminary field review for bidding purposes only. Repair the actual quantities determined by the Engineer. Pothole patching may be reduced, deleted or increased over the bid quantities from the contract. If any of these situations occur, the price of the actual quantity will be paid for at the contract unit price. Department will not allow additional compensation for repairing blow throughs, or for removing and repairing failed patches. Use quick setting patch materials. Structure No. C-753.			

13	**05831000***	**Joint Gland Replacement**	**Feet**
Install new Neoprene Gland at Abutment #4, Structure C-753, Jensen Bridge. Includes all materials and labor.			

14	**071050010**	**Waterproofing Membrane**	**Square Feet**

15	**079220010**	**Relief Joint Crack Sealing**	**Feet**

16	**028210044**	**Chain Link Brace Post**	**Each**
In place.			

17	**02821004P**	**7 ft Chain Link Fence, Type IV, with Barbed Wire and Arm**	**Feet**
In place			

18	**02821005P**	**Chain Link Gate, H = 6 ft x W = 5 ft**	**Each**
In place. Includes all hardware.			

19	**13553002P**	**2” Conduit, Schedule 40 PVC**	**Feet**
In place. Includes trenching, fittings, connections, sweeps and pull tape.			

20	**13553003P**	**1½” Conduit, Schedule 40 PVC**	**Feet**
In place. Includes trenching, fittings, connections, sweeps and pull tape.			

21	**13554002P**	**Polymer Concrete Junction Box, Type 1**	**Each**
In place. Includes all materials, including concrete and grout, ground rod and acorn clip.			

22	**13554003P**	**Polymer Concrete Junction Box, Type II**	**Each**
In place. Includes all materials, including concrete and grout, ground rod and acorn clip.			

23	**13592000***	**Concrete Service Pad**	**Lump Sum**
In place. Includes concrete tower base foundation, all necessary reinforcement, State-furnished materials, ground rods, clamps and all work necessary to complete the item.			

IX. PDBS Project Summary Report

Summary Report

Project: SP-0040(51)81 **Version: 1**

US-40 BRIDGES; STARVATION RES. & JENSEN BRIDGES

Detail	Alt Group	Alt #	Description
20 - STRUCTURES	0	0	

Item Number	Description	Qty	Unit
012850010	Mobilization	1	Lump
01554000*	Traffic Control	1	Lump
01557001*	Variable Message Sign	150	Cal d
01559008*	Temporary Traffic Signal	150	Cal d
02225000*	Asphalt Surfacing Removal (Structures)	3,115	sq yd
02741006P	HMA - 3/4 inch (TLA Binder)	350	Ton
027480040	Emulsified Asphalt CSS-1	4	Ton
027650060	Pavement Marking Paint	5,250	ft
03371000*	Epoxy-Urethane Polymer Crack Treatment and Waterproofing Overlays for Bridge Decks	67,310	sq ft
03381000*	Clear Penetrating Concrete Sealer for Bridges	4,840	ft
03921000*	Parapet Surface Repair	1,700	ft
03934000*	Structure Pothole Patching, Quick Set	4,210	sq ft
05831000*	Joint Gland Replacement	46	ft
071050010	Waterproofing Membrane	28,100	sq ft
079220010	Relief Joint Crack Sealing	182	ft

Detail	Alt Group	Alt #	Description
70 - ATMS	0	0	

Item Number	Description	Qty	Unit
028210044	Chain Link Brace Post	4	Each
02821004P	7 ft Chain Link Fence, Type IV, with Barbed Wire and Arm	34	ft
02821005P	Chain Link Gate, H= 6 ft X W= 5 ft	2	Each
13553002P	2" Conduit, Schedule 40 PVC	800	ft
13553003P	1 1/2" Conduit, Schedule 40 PVC	10	ft
13554002P	Polymer Concrete Junction Box, Type I	1	Each
13554003P	Polymer Concrete Junction Box, Type II	3	Each
13592000*	Concrete Service Pad	1	Lump

X. PDBS Detailed Stationing Summaries Report

Detailed Report

SP-0040(51)81 **Version: 1**

US-40 BRIDGES; STARVATION RES. & JENSEN BRIDGES

20 - STRUCTURES **Alt Group: 0** **Alt #: 0**

Item Number	Description	Use Qty	Unit
01554000*	**Traffic Control**	1	Lump

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN						2 Req'd per structure
					0.0	

02225000*	**Asphalt Surfacing Removal (Structures)**	3,115	sq yd

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-753				3,115.0	(636.67L x 44W)/9 = 3112.6
					3,115.0	

02741006P	**HMA - 3/4 inch (TLA Binder)**	350	Ton

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-753				350.0	((3115 x 9)(2/12)(148))/2000 = 345.8
					350.0	

027480040	**Emulsified Asphalt CSS-1**	4	Ton

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-753				4.0	((3150 x 0.30)/239 = 3.95
					4.0	

027650060	**Pavement Marking Paint**	5,250	ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-560				3,778.0	(1679 X 2) + (1679 x 0.25) = 3777.8
MAIN	C-753				1,433.0	(637 X 2) + (637 X 0.25) = 1433.2
					5,211.0	

03371000*	**Epoxy-Urethane Polymer Crack Treatment and Waterproofing Overlays for Bridge I**	67,310	sq ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-560				67,310.0	1679 X 40 = 67160
					67,310.0	

Detailed Report

SP-0040(51)81 **Version: 1**

US-40 BRIDGES; STARVATION RES. & JENSEN BRIDGES

20 - STRUCTURES **Alt Group: 0** **Alt #: 0**

Item Number	Description	Use Qty	Unit

03381000* **Clear Penetrating Concrete Sealer for Bridges** 4,840 ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-753				1,280.0	636.67 X 2 = 1273.3
MAIN	C-560				3,360.0	1679 X 2 = 3358
					4,640.0	

03921000* **Parapet Surface Repair** 1,700 ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-560				1,700.0	
					1,700.0	

03934000* **Structure Pothole Patching, Quick Set** 4,210 sq ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-753				4,210.0	(3115 X 9)(15%) = 4205.2
					4,210.0	

05831000* **Joint Gland Replacement** 46 ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-753				46.0	44 + 1.5 = 45.5 Abut. 4, East End of Structure
					46.0	

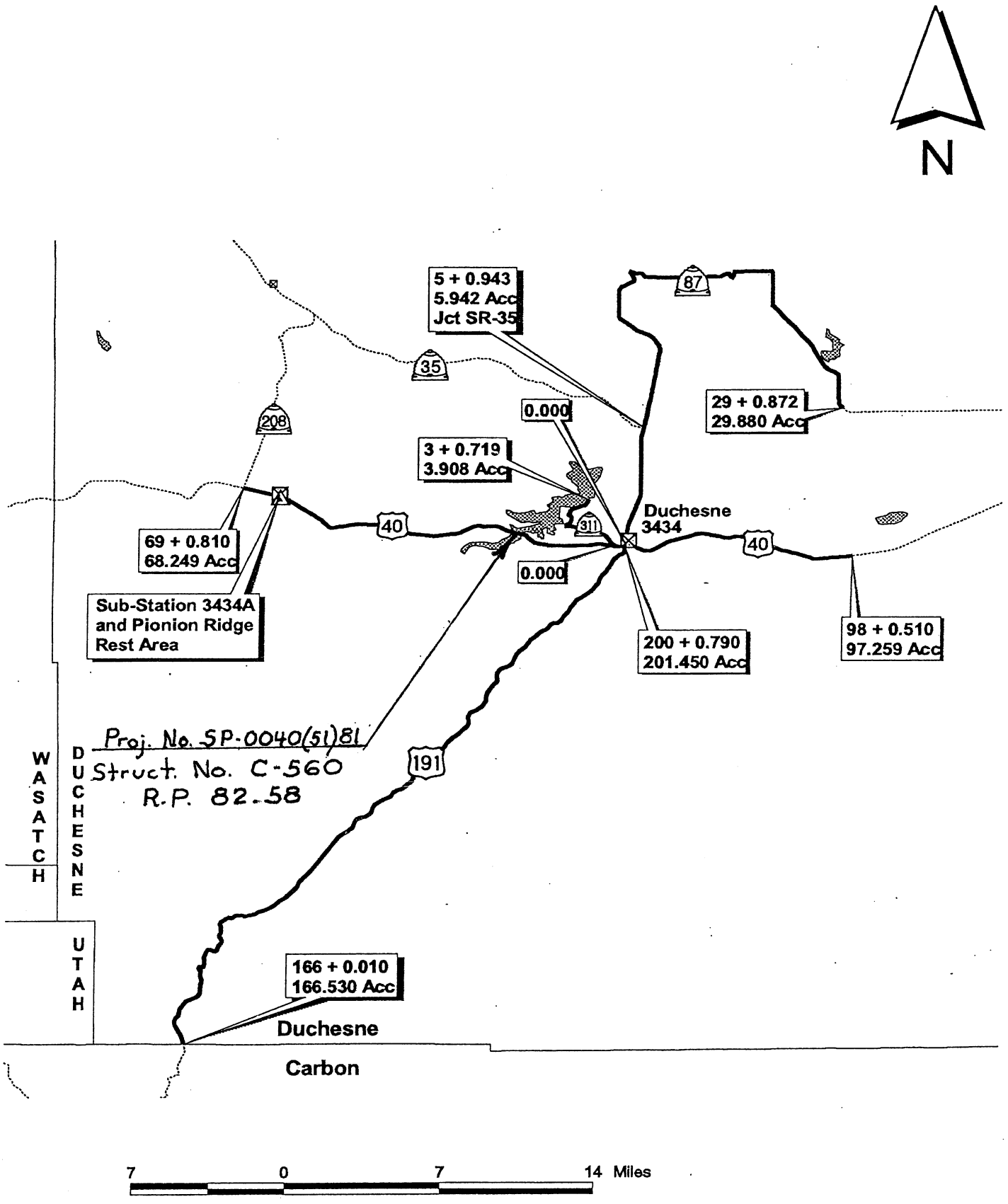
071050010 **Waterproofing Membrane** 28,100 sq ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-753				28,100.0	3115 X 9 = 28035
					28,100.0	

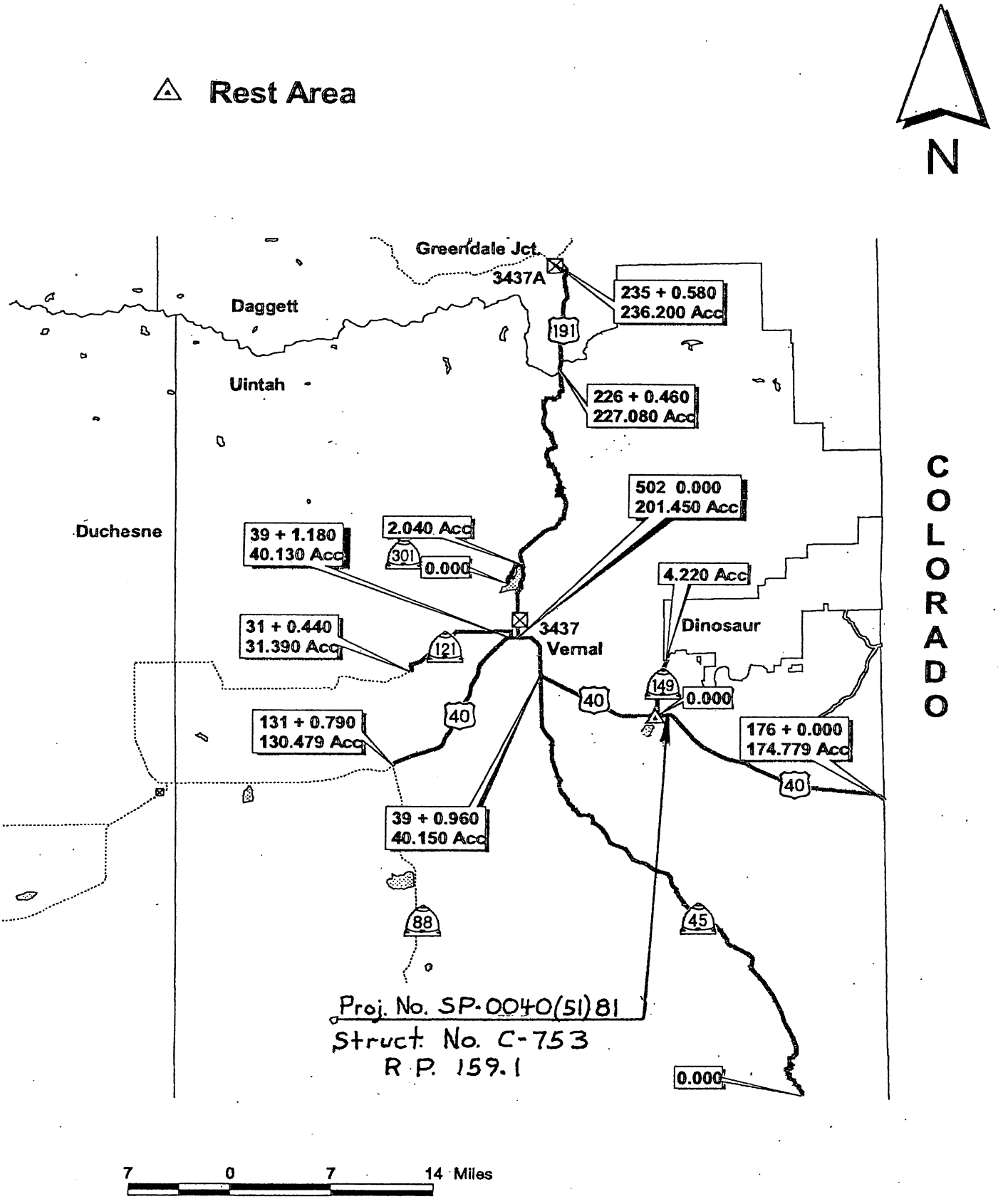
079220010 **Relief Joint Crack Sealing** 182 ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
MAIN	C-560				87.0	43.5 X 2 = 87
MAIN	C-753				95.0	47.1 X 2 = 94.2
					182.0	

XI. Location Map


N
5 + 0.943
5.942 Acc
Jct SR-35
87
35
29 + 0.872
29.880 Acc
0.000
208
3 + 0.719
3.908 Acc
Duchesne
3434
40
311
69 + 0.810
68.249 Acc
40
0.000
Sub-Station 3434A
and Pionion Ridge
Rest Area
200 + 0.790
201.450 Acc
98 + 0.510
97.259 Acc
Proj. No. SP-0040(51)81
Struct. No. C-560
R.P. 82.58
191
WASATCH
DUCHESNE
UTAH
166 + 0.010
166.530 Acc
Duchesne
Carbon
7 0 7 14 Miles

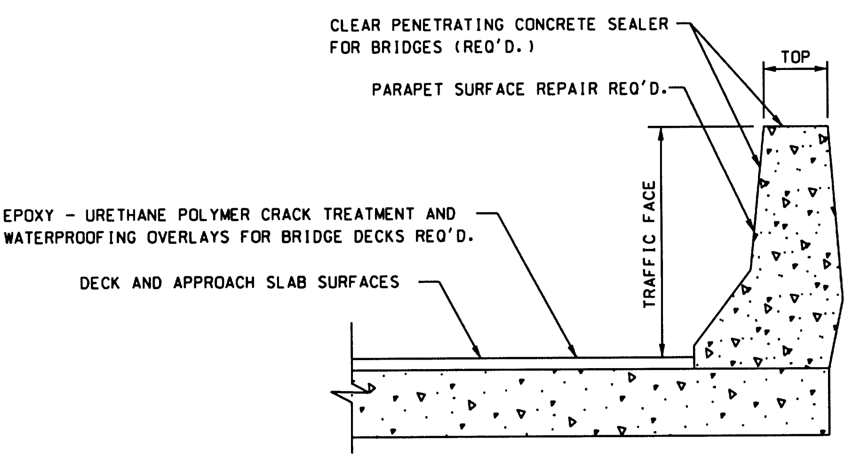
△ Rest Area


N
Greendale Jct.
3437A
Daggett
Uintah
Duchesne
191
235 + 0.580
236.200 Acc
226 + 0.460
227.080 Acc
502 0.000
201.450 Acc
39 + 1.180
40.130 Acc
2.040 Acc
301
0.000
4.220 Acc
Dinosaur
31 + 0.440
31.390 Acc
121
3437
Vernal
40
149
0.000
131 + 0.790
130.479 Acc
176 + 0.000
174.779 Acc
39 + 0.960
40.150 Acc
88
45
Proj. No. SP-0040(51)81
Struct No. C-753
R P. 159.1
0.000
COLORADO
7 0 7 14 Miles

XII. Typical Sections or Detail Sheets

STRUCTURE C-560 R7

OVERLAY AND CONCRETE SEALANT



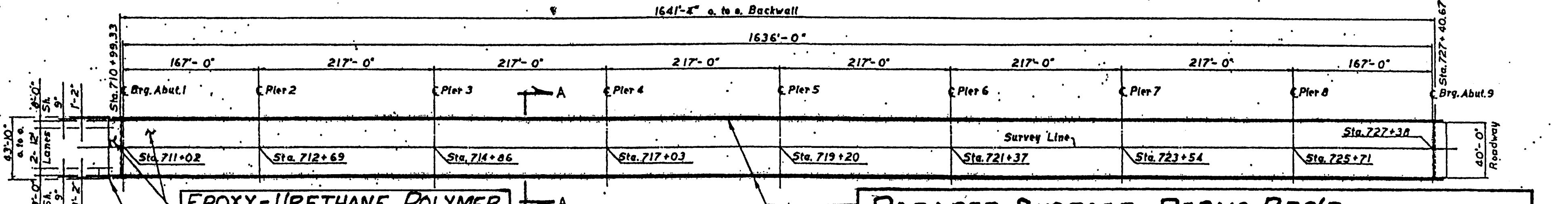
NOTE: SEE DRAWINGS FOR PARAPET DIMENSIONS

NOTES:

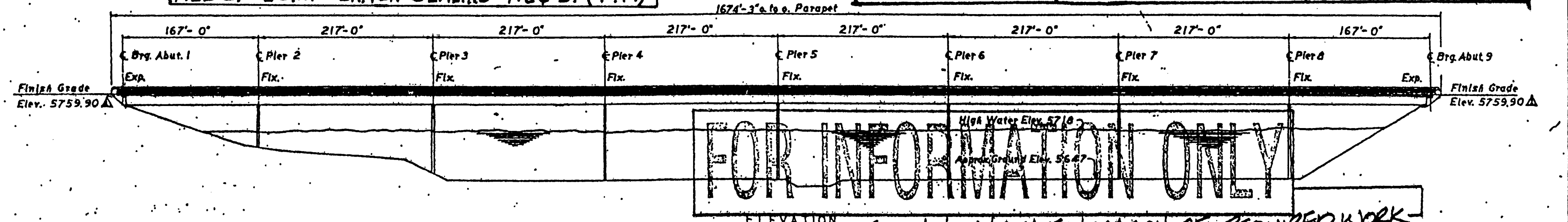
1. APPLY EPOXY-URETHANE POLYMER OVERLAY TO ENTIRE DECK AND APPROACH SLAB SURFACES.
2. APPLY CLEAR PENETRATING CONCRETE SEALER TO TRAFFIC FACE AND TOP OF PARAPET.
3. REPAIR PARTIAL DEPTH POTHOLES IN DECK AND APPROACH SLAB SURFACES WITH EPOXY-URETHENE POLYMER CRACK TREATMENT AND WATERPROOFING OVERLAYS FOR BRIDGE DECKS.

APPROVED BY Paul J. Mainari 6/12/03 Sunrise Engr.

NAME DATE COMPANY

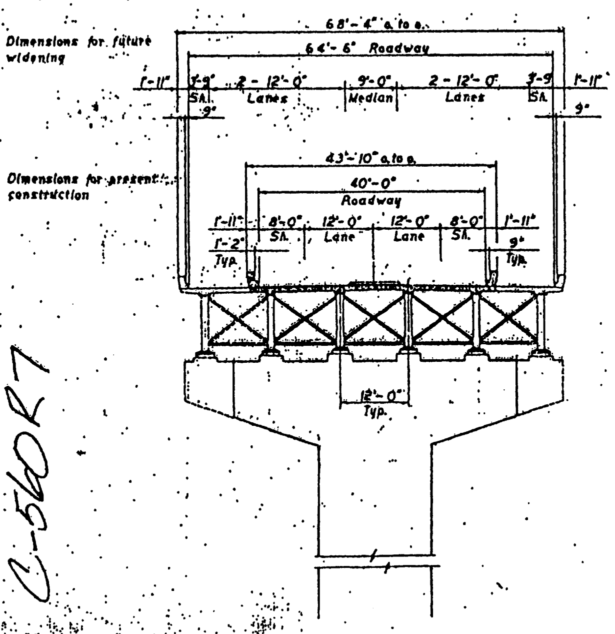


PLAN



ELEVATION

EXCEPT TO INDICATE LOCATION OF REQUIRED WORK



SECTION A-A

QUANTITIES

	ITEM	ESTIMATED	UNIT	AS CONST.
	Excavation for Structure (Unclass)	6,340	Cu.Yd.	7,011.00
	Class A Concrete (AE)	5,497	Cu.Yd.	5,691.00
	Class AA Concrete (AE)	2,511	Cu.Yd.	2,511.00
Δ	Reinforcing Steel	1,688,617	Lb.	1,688,343.00
▲	Structural Steel	3,426,009	Lb.	3,426,009.00
	Metal Railing (Single Rail)	3,349	Lin.Ft.	3,349.00
	Structural Back Fill	3,250	Cu.Yd.	3,799.70
	Excavation Seal	1,500	Sq.Yd.	175.70
	Compaction	100	Hr.	31.50

GENERAL NOTES

1- Materials, construction and workmanship shall be in accordance with the Utah Department of Highways Standard Specifications for Road and Bridges Construction, Interim Issue March 1968 Edition and Supplements thereto, which are in effect at the date of request for bids.

2- All reinforcing steel shall be intermediate grade billet steel, conforming with A.A.S.H.O. designation M-31. Deformations shall conform with A.A.S.H.O. designation M-137.

3- All structural steel shall be structural carbon steel conforming with A.A.S.H.O. designation M-183 (A.S.T.M. A-36) except as noted

4- Exposed concrete corners shall be chamfered ¾" except where noted otherwise.

5- Cover to reinforcing steel shall be 2" except where noted otherwise

DESIGN DATA

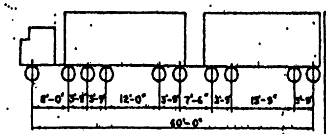
HS20-44 Loading in accordance with A.A.S.H.O. Specifications of 1965 or Alternate truck as shown.

Cast-in-place Concrete: f'c = 3,000 psi, fs (Reinf) = 20,000 psi.
fc = 1,200 psi, n = 10

Structural Steel: fs = 20,000 psi.

Wearing Surface: 1" Concrete, 15 lb/sq.ft. Future Surface.

INDEX OF SHEETS



All Axles 18k - Total 180k

▲	M.K.C.	8-M	Structural Steel
▲	N.U.S.	8-M	Elevation
Δ	T.L.A.	5/71	Reinforcing Steel

REVISIONS

UTAH STATE DEPARTMENT OF HIGHWAYS
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

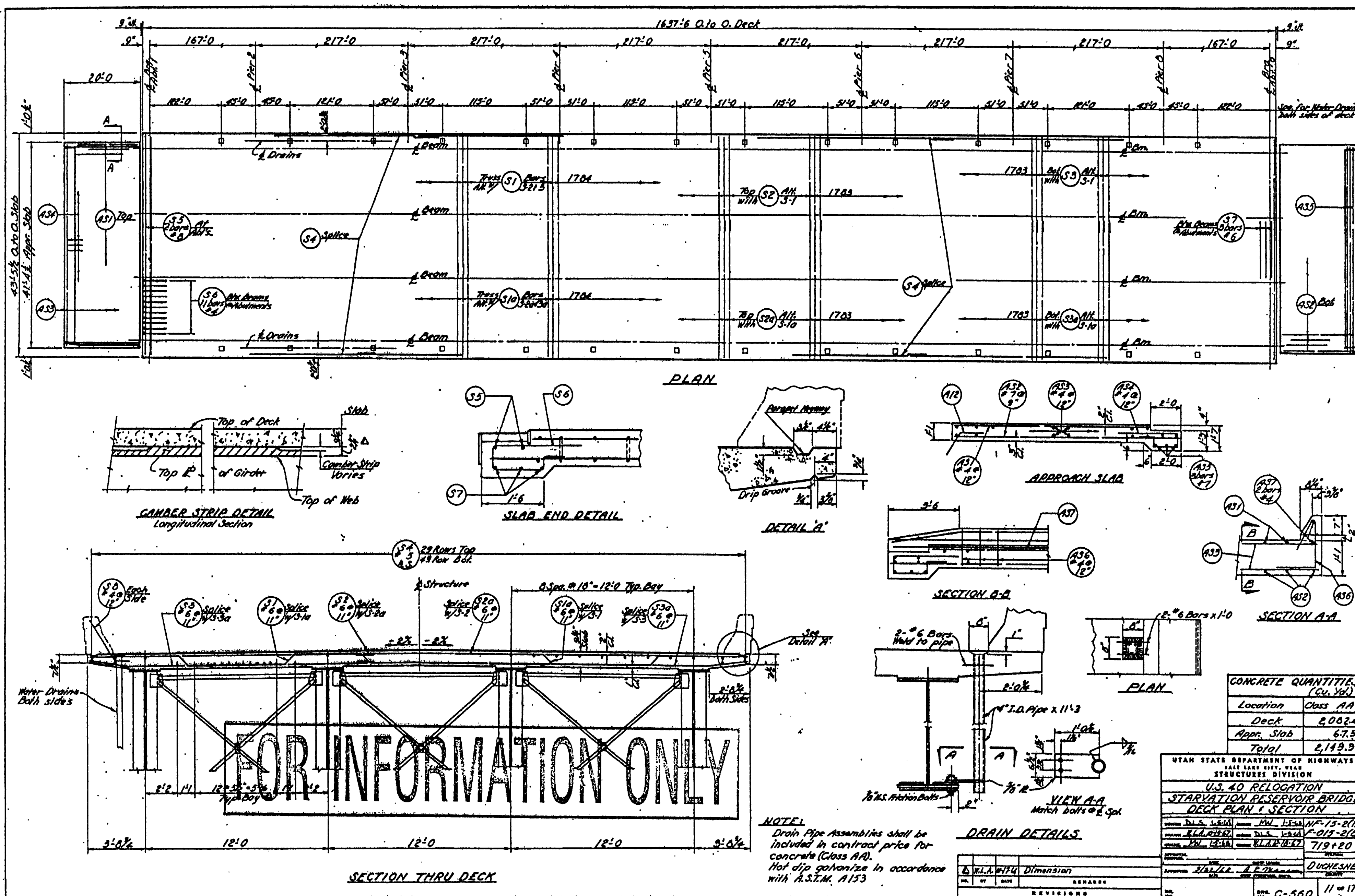
US 40 RELOCATION
STARVATION RESERVOIR BRIDGE
SITUATION & LAYOUT

719 & 20
DUCHESNE
C-560
1 of 17

Final: Sep. 25 69

STP

C-560 R7



NOTE:
Drain Pipe Assemblies shall be included in contract price for concrete (Class AA).
Hot dip galvanize in accordance with A.S.T.M. A153

CONCRETE QUANTITIES (Cu. Yd.)	
Location	Class AA
Deck	2,062.4
Appr. Slab	67.5
Total	2,149.9

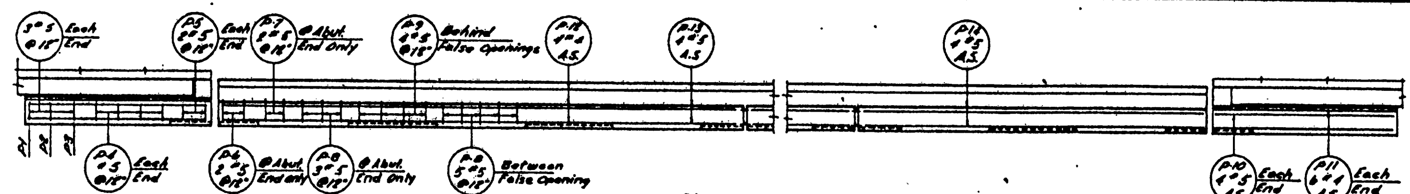
UTAH STATE DEPARTMENT OF HIGHWAYS
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

U.S. 40 RELOCATION
STARVATION RESERVOIR BRIDGE
DECK PLAN & SECTION

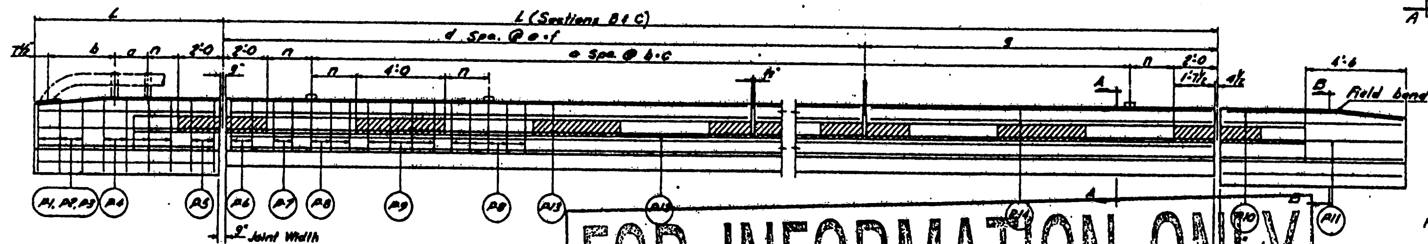
NF-15-2(1)
F-015-2(2)
719+20
DUCHESNE

Δ W.L.A. 4-17-6 Dimension
REVISIONS

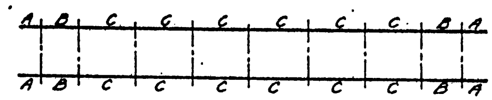
DWG. NO. C-560
11 of 17



PLAN

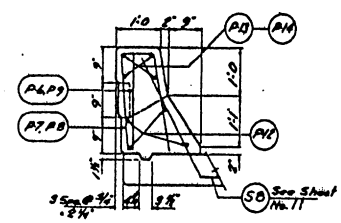


ELEVATION

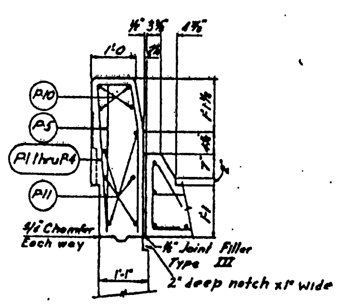


KEY PLAN

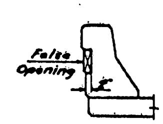
Notes:
1. See sheet no. 15 for details of Railing installation.
2. All longitudinal bars are shown in reinforcing schedule with subscripts which refer to the parapet section where they are located (See Key Plan).
3. Forms for false openings shall be tapered approximately 1/8" to facilitate removal of forms.
4. Cover to reinforcing steel shall be 1½" minimum.
5. Payment for 1" ϕ Galvanized pipe sleeves shall be included in contract price for Class A.A. Concrete (A.E).
6. Drawing number to be located on right-hand side of approach parapet.



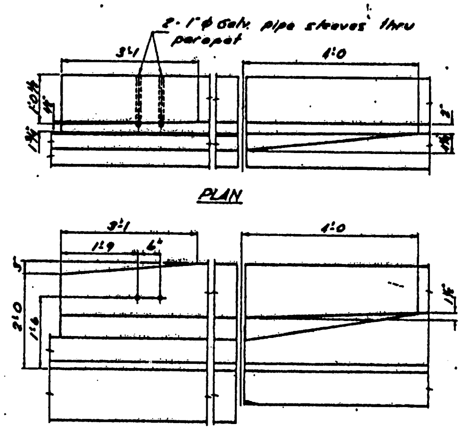
SECTION A-A



SECTION B-B



False Opening

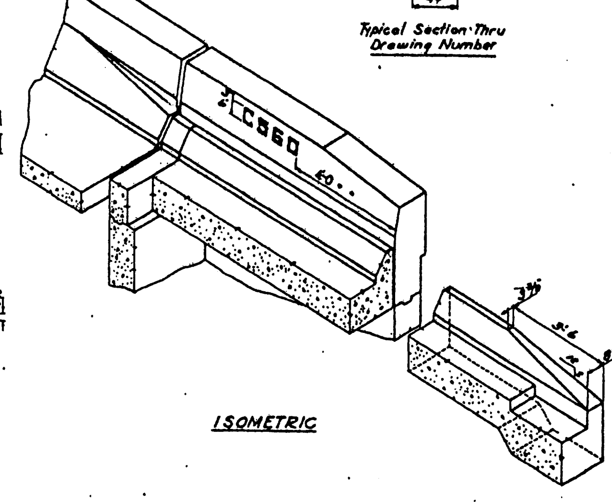


PLAN

ELEVATION

PARAPET END DETAILS

Typical Section Thru Drawing Number



ISOMETRIC

SCHEDULE										
Parapet Section	No. of Sections	a	b	c	d	e	f	g	n	L
A	4	8'-1½	4'-10¼						2'-2	18'-0
B	4	19	8'-1½	159'-8½	6	25'-2½	151'-3½	16'-9½	2'-2½	168'-1½
C	12	25	8'-1½	208'-7½	8	25'-0½	200'-3½	16'-8½	2'-2½	217'-0

Concrete Quantities for all Parapets - 359 Cu. Yd. Class AA

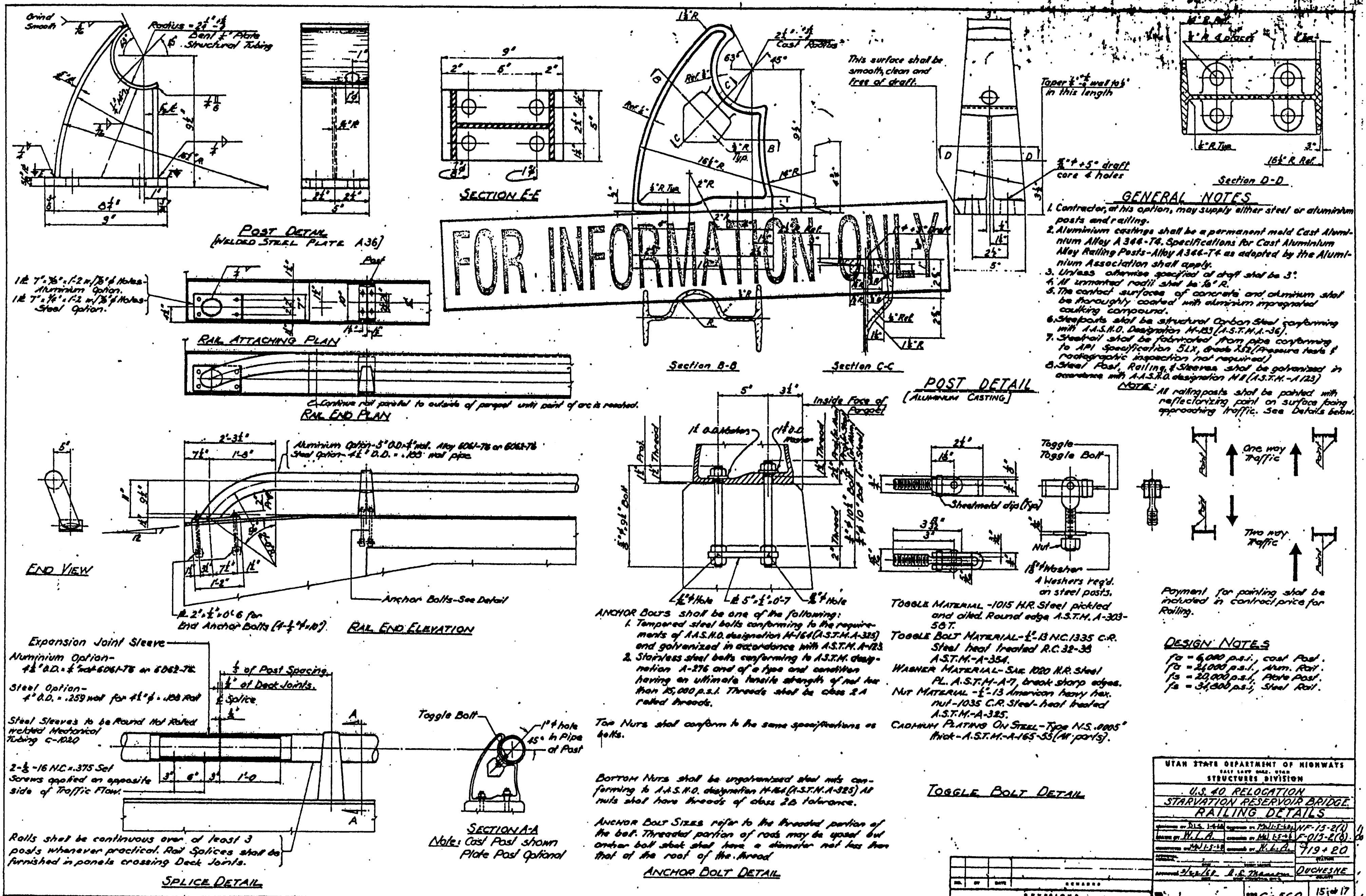
UTAH STATE DEPARTMENT OF HIGHWAYS
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

U.S. 40 RELOCATION
STARVATION RESERVOIR BRIDGE
PARAPET DETAIL

DESIGNED DLS 1-5-68 — CHECKED MW 3-27-68 — NF-15-2(1) 1st Cont.
DRAWN W.L.A. 3-25-68 — CHECKED MW 3-27-68 — F-015-2(a)
CHECKED W.L.A. 3-25-68 — CHECKED MW 3-27-68 — 719+20 STATION
APPROVED 3/22/68 — DUCHESNE COUNTY

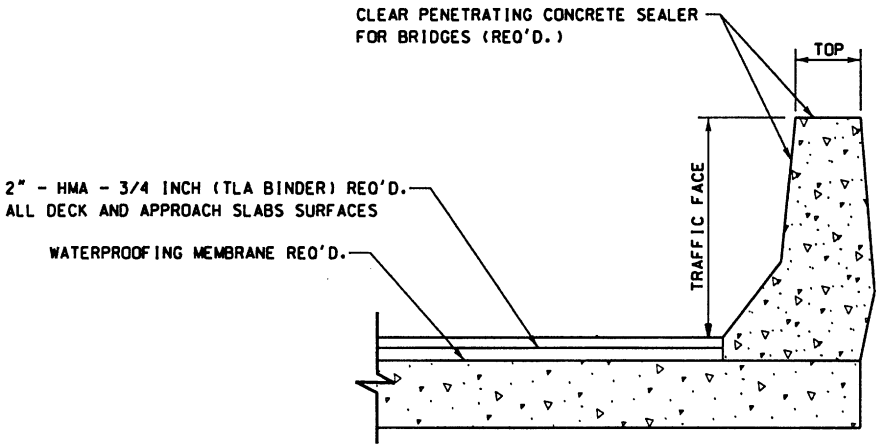
REVISIONS: NO. | BY | DATE | REMARKS

DWG. NO. C-560 — 14 of 17


FOR INFORMATION ONLY
POST DETAIL
(WELDED STEEL PLATE A36)
SECTION E-E
RAIL ATTACHING PLAN
RAIL END PLAN
Continue rail parallel to outside of parapet until point of arc is reached.
END VIEW
RAIL END ELEVATION
Aluminium Option-5" O.D.×¼" wall. Alloy 6061-T6 or 6063-T6
Steel Option-4½" O.D.×.185 wall pipe.
Anchor Bolts-See Detail
Section B-B
Section C-C
POST DETAIL
(ALUMINUM CASTING)
This surface shall be smooth, clean and free of draft.
Section D-D
GENERAL NOTES
1. Contractor, at his option, may supply either steel or aluminum posts and railing.
2. Aluminium castings shall be a permanent mold Cast Aluminum Alloy A 344-T4. Specifications for Cast Aluminium Alloy Railing Posts-Alloy A344-T4 as adopted by the Aluminium Association shall apply.
3. Unless otherwise specified all draft shall be 3°.
4. All unmarked radii shall be 1/16" R.
5. The contact surfaces of concrete and aluminum shall be thoroughly coated with aluminum impregnated caulking compound.
6. Steelposts shall be structural Carbon Steel conforming with A.A.S.H.O. Designation M-183 (A.S.T.M.A.-36).
7. Steelrail shall be fabricated from pipe conforming to API Specification 5LX, Grade X52 (Pressure tests & radiographic inspection not required)
8. Steel Post, Railing, & Sleeves shall be galvanized in accordance with A.A.S.H.O. designation M8 (A.S.T.M.-A123)
NOTE: All railingposts shall be painted with reflectorizing paint on surface facing approaching traffic. See Details below.
One way Traffic
Two way Traffic
Payment for painting shall be included in contract price for Railing.
DESIGN NOTES
fa = 6,000 p.s.i., cast Post.
fa = 24,000 p.s.i., Alum. Rail.
fs = 20,000 p.s.i., Plate Post.
fs = 34,000 p.s.i., Steel Rail.
ANCHOR BOLTS shall be one of the following:
1. Tempered steel bolts conforming to the requirements of A.A.S.H.O. designation M-164 (A.S.T.M.A-325) and galvanized in accordance with A.S.T.M. A-123.
2. Stainless steel bolts conforming to A.S.T.M. designation A-276 and of a type and condition having an ultimate tensile strength of not less than 85,000 p.s.i. Threads shall be class 2A rolled threads.
Top Nuts shall conform to the same specifications as bolts.
Bottom Nuts shall be ungalvanized steel nuts conforming to A.A.S.H.O. designation M-164 (A.S.T.M.A-325) All nuts shall have threads of class 2B tolerance.
Anchor Bolt Sizes refer to the threaded portion of the bolt. Threaded portion of rods may be upset but anchor bolt shall have a diameter not less than that of the root of the thread.
ANCHOR BOLT DETAIL
TOGGLE MATERIAL -1015 H.R. Steel pickled and oiled. Round edge A.S.T.M. A-303-58T.
TOGGLE BOLT MATERIAL-½"-13 N.C. 1335 C.R. Steel heat treated R.C. 32-38 A.S.T.M.-A-354.
WASHER MATERIAL-SAE 1020 H.R. Steel PL. A.S.T.M.-A-7, break sharp edges.
NUT MATERIAL -½"-13 American heavy hex. nut-1035 C.R. Steel-heat treated A.S.T.M.-A-325.
CADMIUM PLATING ON STEEL-Type N.S. .0005" thick-A.S.T.M.-A-165-55 (All parts).
4 Washers req'd. on steel posts.
TOGGLE BOLT DETAIL
Expansion Joint Sleeve
Aluminium Option-4⅜" O.D.×¼" wall 6061-T6 or 6062-T6
Steel Option-4" O.D.×.259 wall for 4½" ø ×.188 Rail
Steel Sleeves to be Round Hot Rolled welded Mechanical Tubing C-1020
2-⅝-16 N.C.×.375 Set Screws applied on opposite side of Traffic Flow.
Rails shall be continuous over at least 3 posts whenever practical. Rail Splices shall be furnished in panels crossing Deck Joints.
SPLICE DETAIL
SECTION A-A
Note: Cast Post shown Plate Post Optional
UTAH STATE DEPARTMENT OF HIGHWAYS
STRUCTURES DIVISION
U.S. 40 RELOCATION
STARVATION RESERVOIR BRIDGE
RAILING DETAILS
W.L.A.
F-015-2(8)
NF-15-2(1)
719+20
DUCHESNE
C-360
15 of 17
REVISIONS

STRUCTURE C-753 R

HMA OVERLAY AND CONCRETE SEALANT



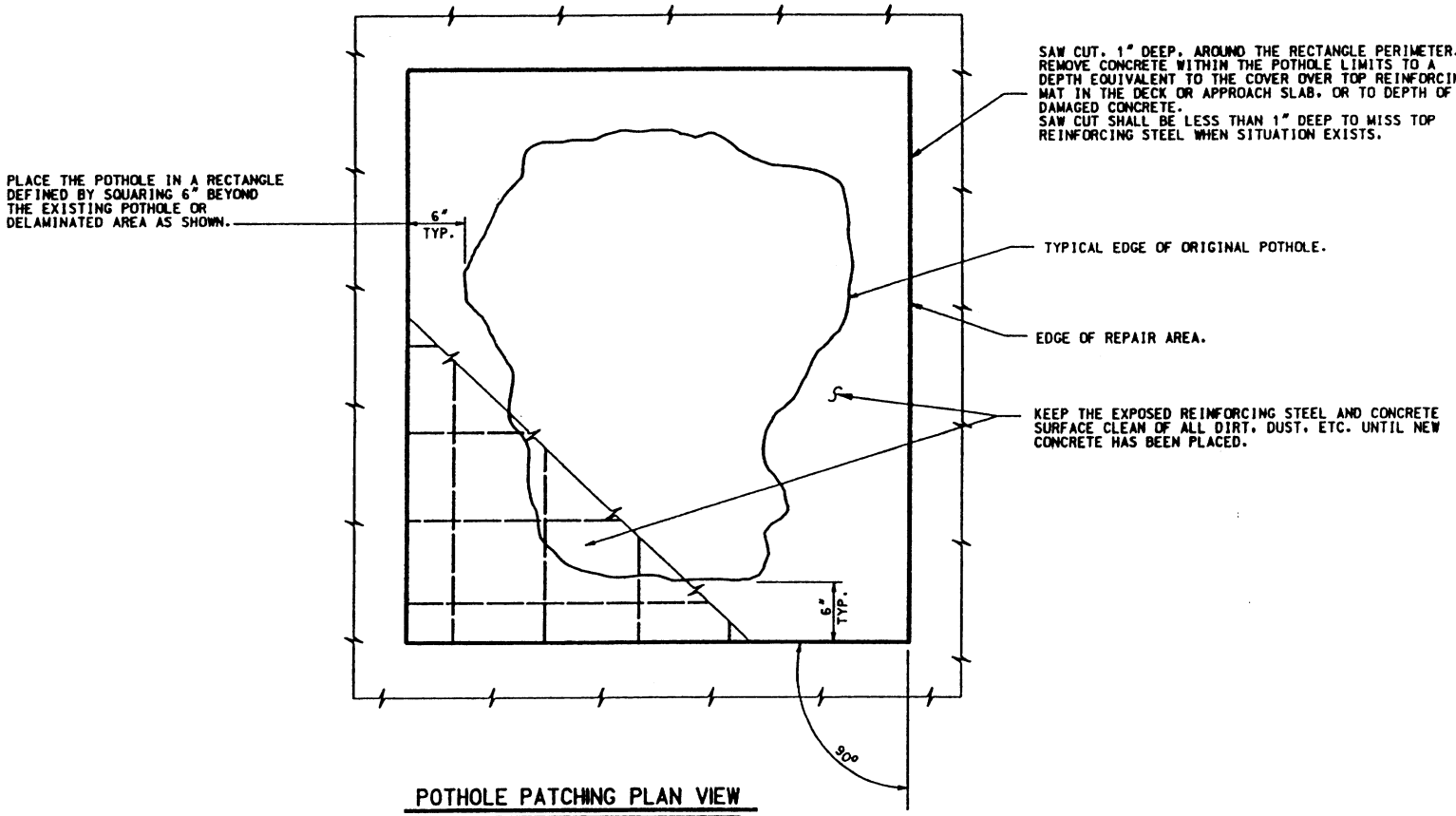
NOTE: SEE DRAWINGS FOR PARAPET DIMENSIONS

NOTES:

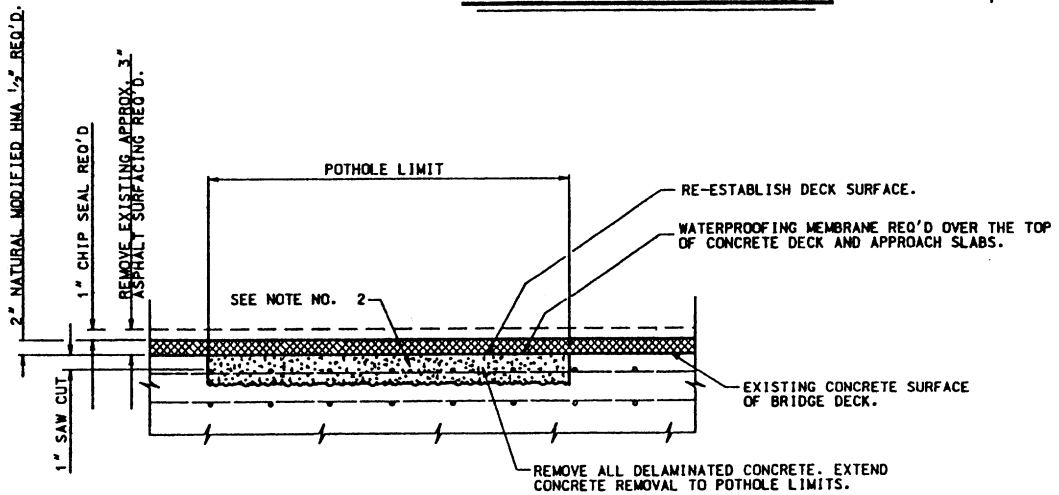
1. APPLY 2 INCH HMA OVERLAY TO ENTIRE DECK SURFACE AND APPROACH SLAB SURFACE.
2. APPLY CLEAR PENETRATING CONCRETE SEALER TO TRAFFIC FACE AND TOP OF PAPAPET.

APPROVED BY Paul L. Marinoni (NAME) 6/12/03 (DATE) Sunrise Engr. (COMPANY)

STRUCTURE: C-753 R



POTHOLE PATCHING PLAN VIEW



TYPICAL POTHOLE PATCHING SECTION

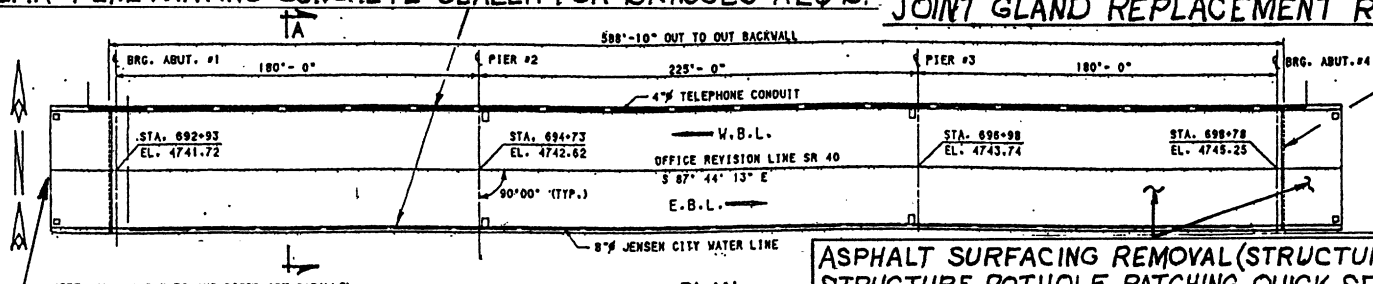
NOTES:

1. SAW CUTTING AROUND THE PERIMETER OF THE POTHOLE LIMITS WILL NOT BE REQUIRED WHEN HYDRODEMOLITION METHOD IS USED TO REMOVE THE DELAMINATED CONCRETE.
2. AFTER REMOVAL OF THE CONCRETE FROM THE REPAIR AREA. CLEAN THE REPAIR AREA BY SANDBLASTING. APPLY AN EPOXY RESIN ADHESIVE (MEETING AASHTO 235, TYPE II) FOR BONDING THE PATCHING CONCRETE TO THE EXISTING HARDENED CONCRETE.
3. MARK AREAS TO BE REPAIRED WITH PAINT PRIOR TO SAW CUTTING FOR APPROVAL FROM THE ENGINEER.
4. ESTIMATED UPTO 15% OF DECK/APPROACH SLAB SURFACE AREAS OF BRIDGES TO REQUIRE POTHOLE PATCHING.
5. QUICK SETTING MATERIAL WILL BE ALLOWED ON POTHOLE LESS THAN 4" IN DEPTH WITH THE APPROVAL OF THE MANUFACTURER OR THE ENGINEER.
6. APPROVED PATCHING CONCRETE PRODUCTS FROM THE PERFORMANCE DATA PRODUCTS LISTING (PDPL), AVAILABLE AT WWW.DOT.UTAH.GOV/RES - J.1 PCC REPAIR MTLS. - HORIZONTAL.

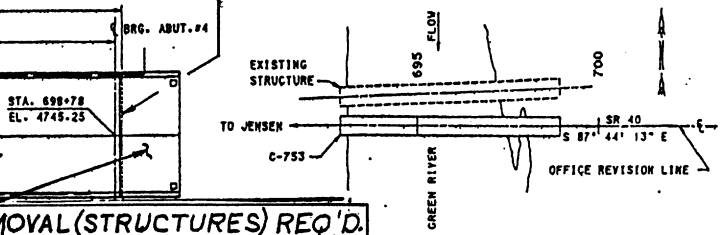
Approved By Paul L. Marinoni 6/12/03 Sunrise Engr.

CLEAR PENETRATING CONCRETE SEALER FOR BRIDGES REQ'D.

JOINT GLAND REPLACEMENT REQ'D. - SEAL CONCRETE HEADER



PLAN

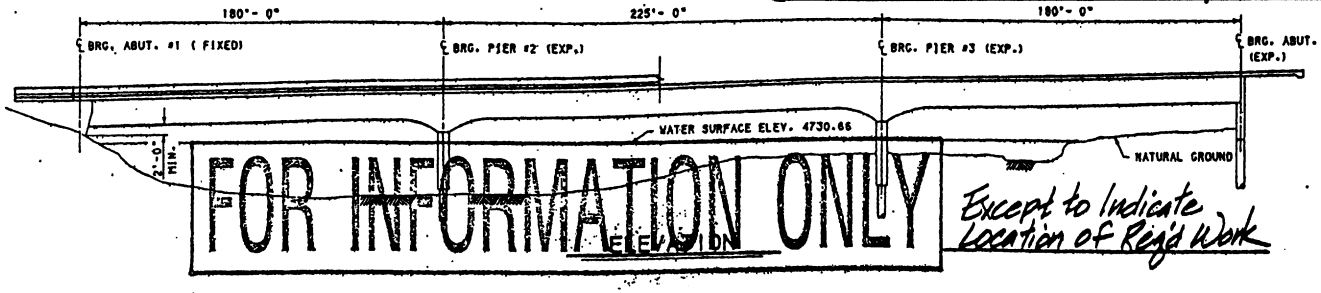


LOCATION PLAN

NOTE: ALL ABUTMENTS AND PIERS ARE PARALLEL TO BRG. N 2° 15' 47" E

RELIEF JOINT CRACK SEALING REQ'D. (TYP.)

ASPHALT SURFACING REMOVAL (STRUCTURES) REQ'D.
STRUCTURE POTHOLE PATCHING, QUICK SET REQ'D.
WATERPROOFING MEMBRANE REQ'D.
2" - HMA - 3/4" (TLA BINDER) REQ'D.



ELEVATION

FOR INFORMATION ONLY

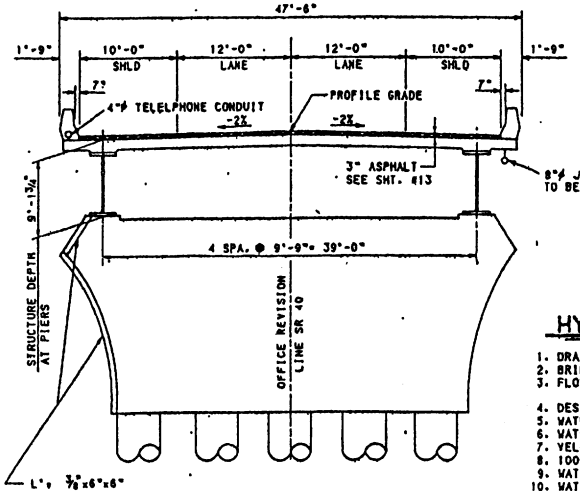
Except to Indicate Location of Reg'd Work

GENERAL NOTES

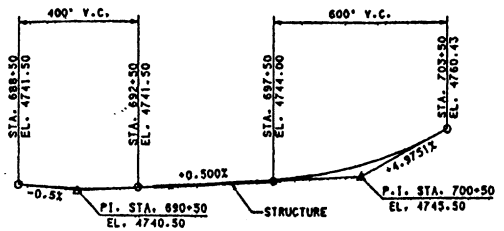
1. ALL REINFORCING STEEL SHALL BE EPOXY-COATED DEFORMED BILLET STEEL BARS CONFORMING TO AASHTO M 31 GRADE 60.
2. ALL STRUCTURAL STEEL SHALL CONFORM TO AASHTO M 270 GRADE 50 W (UNPAINTED) EXCEPT WHERE NOTED OTHERWISE.
3. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4" EXCEPT WHERE NOTED OTHERWISE.
4. COVER TO REINFORCING STEEL SHALL BE 2" EXCEPT WHERE NOTED OTHERWISE.
5. ALL CAST-IN-PLACE CONCRETE SHALL BE CLASS AA(AE) EXCEPT WHERE SPECIFIED OTHERWISE.

DESIGN DATA

HS-20-44 OR INTERSTATE ALTERNATE LOADING IN ACCORDANCE WITH CURRENT AASHTO AND INTERIM SPECIFICATIONS.
CAST-IN-PLACE CONCRETE: f'_c = 1400 PSI; f_s (REINF.) = 24,000 PSI; n = 8.
STRUCTURAL STEEL: F_y = 27,000 PSI.
WEARING SURFACE: ½" CONCRETE; 35 PSF (FUTURE).
DESIGN SPEED: 55 M.P.H.



SECTION A-A



SR 40 PROFILE

HYDRAULIC DATA

1. DRAINAGE AREA = 25,400 SQ. MI.
2. BRIDGE DESIGN FREEQUENCY=50 YRS.
3. FLOWLINE ELEVATION AT APPROACH SECTION=4,719.5 FT.
   AT BRIDGE INLET=4,717.3 FT.
4. DESIGN FLOOD (Q_D)=41,800 CFS
5. WATER SURFACE ELEVATION FOR Q_D WITHOUT BRIDGE=4,730.66 FT.
6. WATER SURFACE ELEVATION FOR Q_D WITH BRIDGE=4,730.66 FT.
7. VELOCITY FOR Q_D AT BRIDGE OUTLET=6.90 FT/SEC
8. 100-YEAR FLOOD (Q_{100})=46,500 CFS
9. WATER SURFACE ELEVATION FOR Q_{100} WITHOUT BRIDGE=4,731.18 FT.
10. WATER SURFACE ELECVATION FOR Q_{100} WITH BRIDGE=4,731.18 FT.
11. OVERTOPPING FLOOD OR Q_{500}, WHICHEVER IS LESS; FREQUENCY=500 YRS.
    DISCHARGE=58,000 CFS
12. WATER SURFACE ELEVATION FOR Q_{OVTR} AT BRIDGE=4,732.4 FT.
13. D_{cs} =DEPTH OF CONTRACTION SCOUR FOR Q_{100}=0 FT.
14. D_{Q100} = TOTAL DEPTH OF SCOUR FOR Q_{100} AT ABUTMENTS=0 FT.
    AT PIERS=7.0 FT
15. DEPTH OF SCOUR FOR Q IN ITEM 11 = AT ABUTMENT=0 FT.
    AT PIERS=7.65 FT.

INDEX OF SHEETS

NO.	BY	DATE	REVISIONS
	V.H	3-10-93	VALUE ENGINEERING

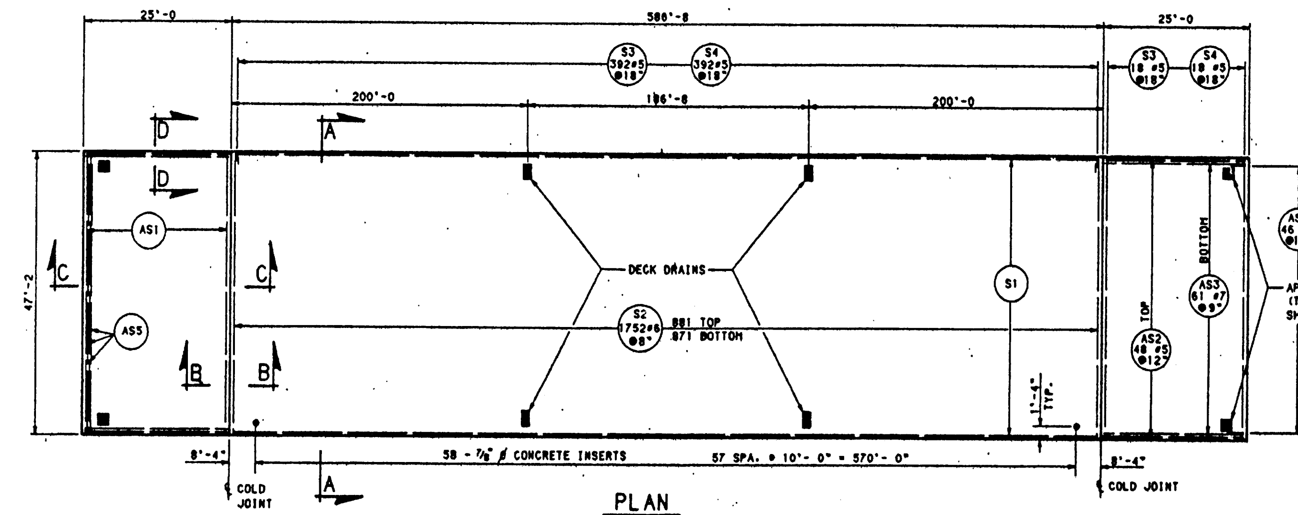
C-753R

C-753

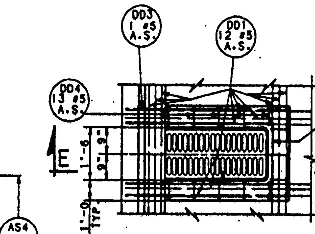
UTAH DEPARTMENT OF TRANSPORTATION
STRUCTURES DIVISION

U.S. 40
GREEN RIVER BRIDGE AT JENSEN
SITUATION AND LAYOUT

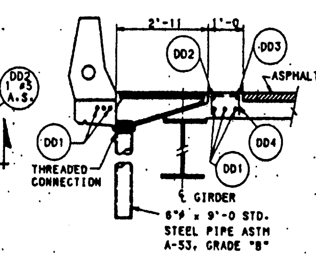
DESIGN M.D. 2-93	CHECK		
DRAWN VIRA-H JULY 93	CHECK VAB 8-93		692+93
CHECK VAB 11-93	CHECK KRM 12-93		
APPROVED 3-1-93			UINTAH
APPROVED 3-10-93			C-753
PROJECT NUMBER	SP-0040(18)159		DWG. NO.
			SHT. 1 OF 20



PLAN



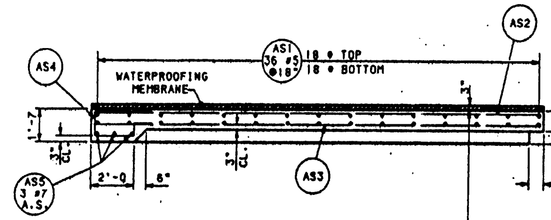
DECK DRAIN PLAN



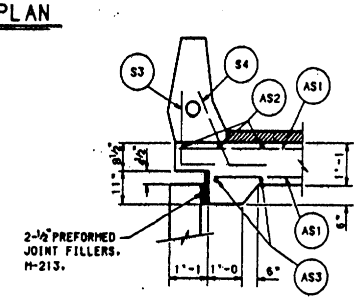
SECTION E-E

DECK DRAIN NOTES

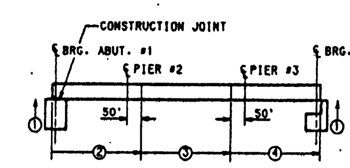
1. STEEL DRAIN PIPE SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS FOR ZINC (HOT-GALVANIZED) COATINGS. AASHTO M-111 (ASTM A-123).
2. DECK DRAIN CASTING TO BE MADE OF MODULAR IRON ASTM A-536 GRADE 60-40-18. MFGRS. DETAILS REQ'D.
3. DECK DRAINS ARE INCLUDED IN CONTRACT PRICE FOR STRUCTURAL STEEL.
4. 4 DECK DRAINS REQ'D. APPROX. WEIGHT 551 LBS. EACH. INCL. PIPE.
5. FIELD BEND REINFORCING STEEL TO ACCOMMODATE DECK DRAINS.



SECTION C-C

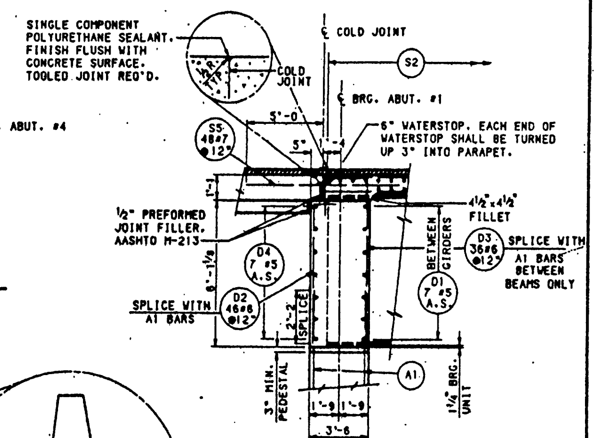


SECTION D-D



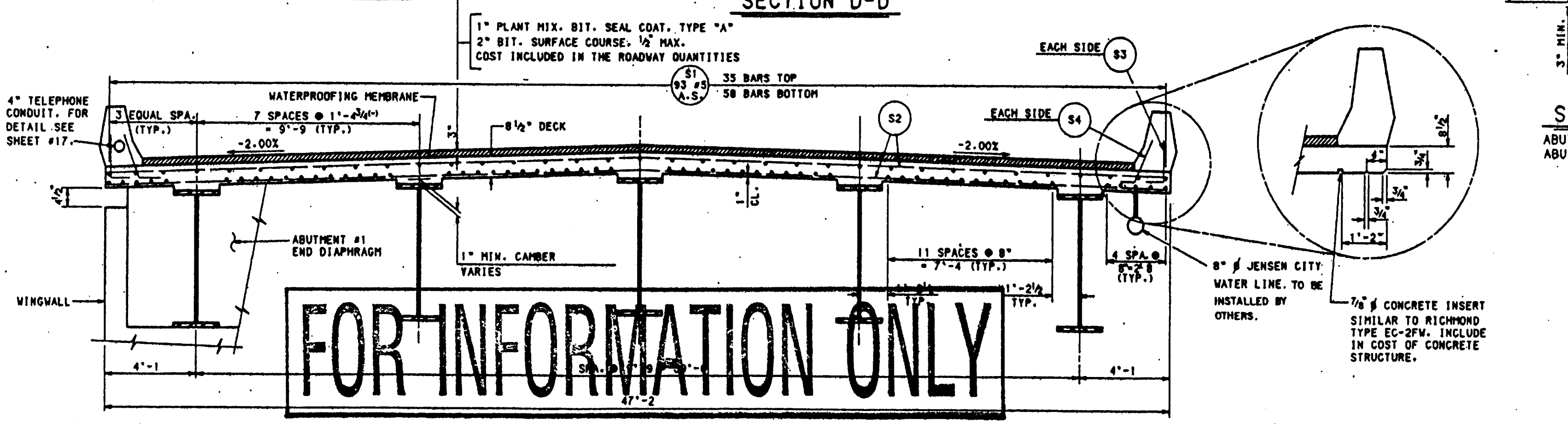
DECK PLACING SEQUENCE

1. NUMBER DESIGNATES PLACING SEQUENCE.
2. ARROW DESIGNATES REQUIRED DIRECTION OF PLACEMENT.



SECTION B-B

ABUTMENT #1 ONLY. FOR ABUT. #4 SEE SHEET #5.



SECTION A-A

CONCRETE QUANTITIES	
LOCATION	CLASS AA(AE)
DECK & CAMBER	746.0 CU. YDS.
ABUT. #1 END DIAPH.	37.3 CU. YDS.
APPROACH SLABS	99.1 CU. YDS.
TOTAL	882.4 CU. YDS.

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DECK PLAN AND SECTIONS

AFM 8-92 KMI 10-92
AFM 8-92 KMI 10-92

692+93

UINTAH

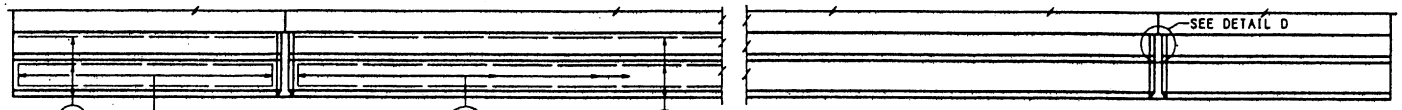
C-753

SP-0040(18)159

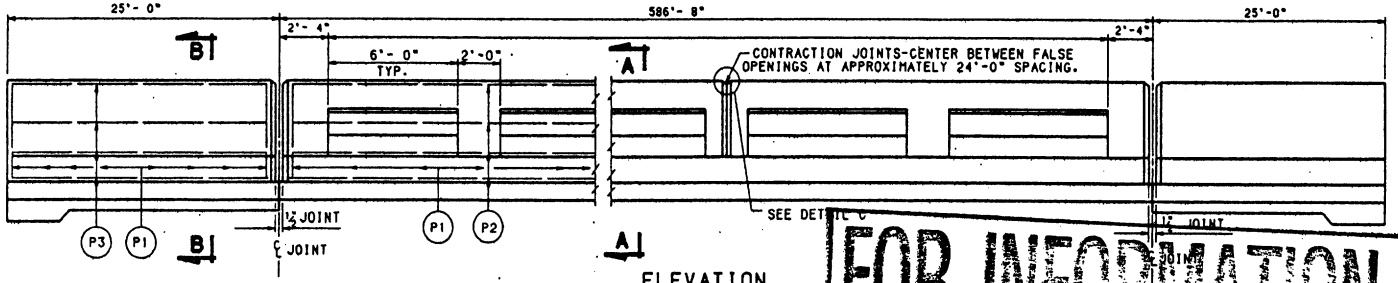
SHT. 13 of 20

NO.	BY	DATE	REMARKS

REVISIONS

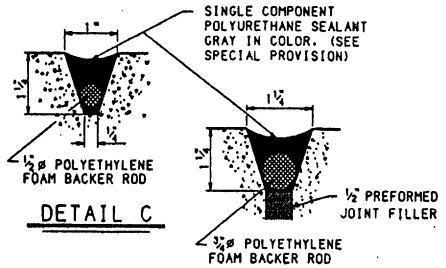


PLAN



ELEVATION

ALL DIMENSIONS SHOWN ARE ALONG EDGE OF DECK.

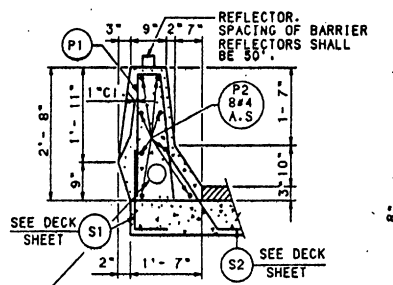


DETAIL C

DETAIL D

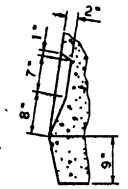
GENERAL NOTES

1. ALL REINFORCING STEEL SPLICES SHALL BE [illegible].
2. COVER TO REINFORCING STEEL SHALL BE 1½" MIN. UNLESS NOTED OTHERWISE.
3. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
4. DRAWING NUMBER TO BE LOCATED ON RIGHT-HAND SIDE OF APPROACH PARAPET.
5. PLACE CONTRACTION JOINT ON SIDES AND TOP OF PARAPET.
6. SEALANT AND FOAM BACKER ROD SHALL EXTEND FROM DECK TO TOP OF THE PARAPET ON THE INSIDE PARAPET FACE, AND ACROSS TOP OF PARAPET.
7. BARRIER REFLECTORS SHALL CONFORM TO STANDARD DRAWING NO. 726-1



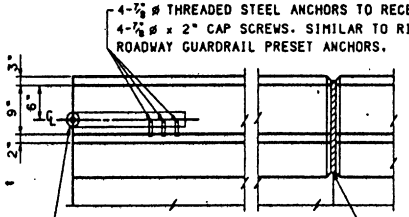
SECTION A-A

4" ø TELEPHONE CONDUIT NORTH SIDE ONLY



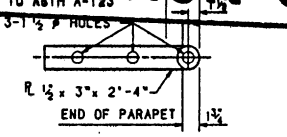
FALSE OPENING

(PARTIAL SECTION)



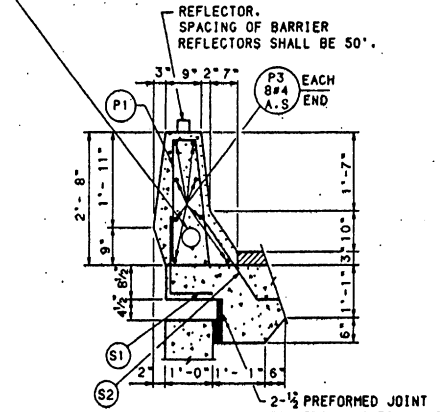
PLAN

½ PREFORMED JOINT FILLER



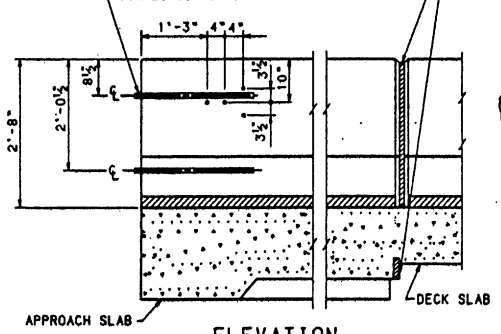
STEEL TO BE ASTM A-36 OR ASTM A-575 GRADE 1020

CONNECTION BAR DETAIL



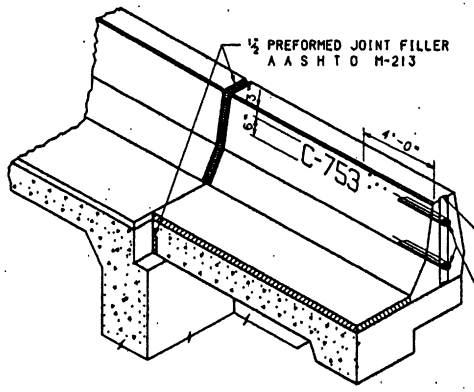
2-½ PREFORMED JOINT FILLERS. AASHTO M-213

SECTION B-B



ELEVATION

PARAPET END DETAILS



ISOMETRIC

TYPICAL SECTION THRU DRWG. NUMBER

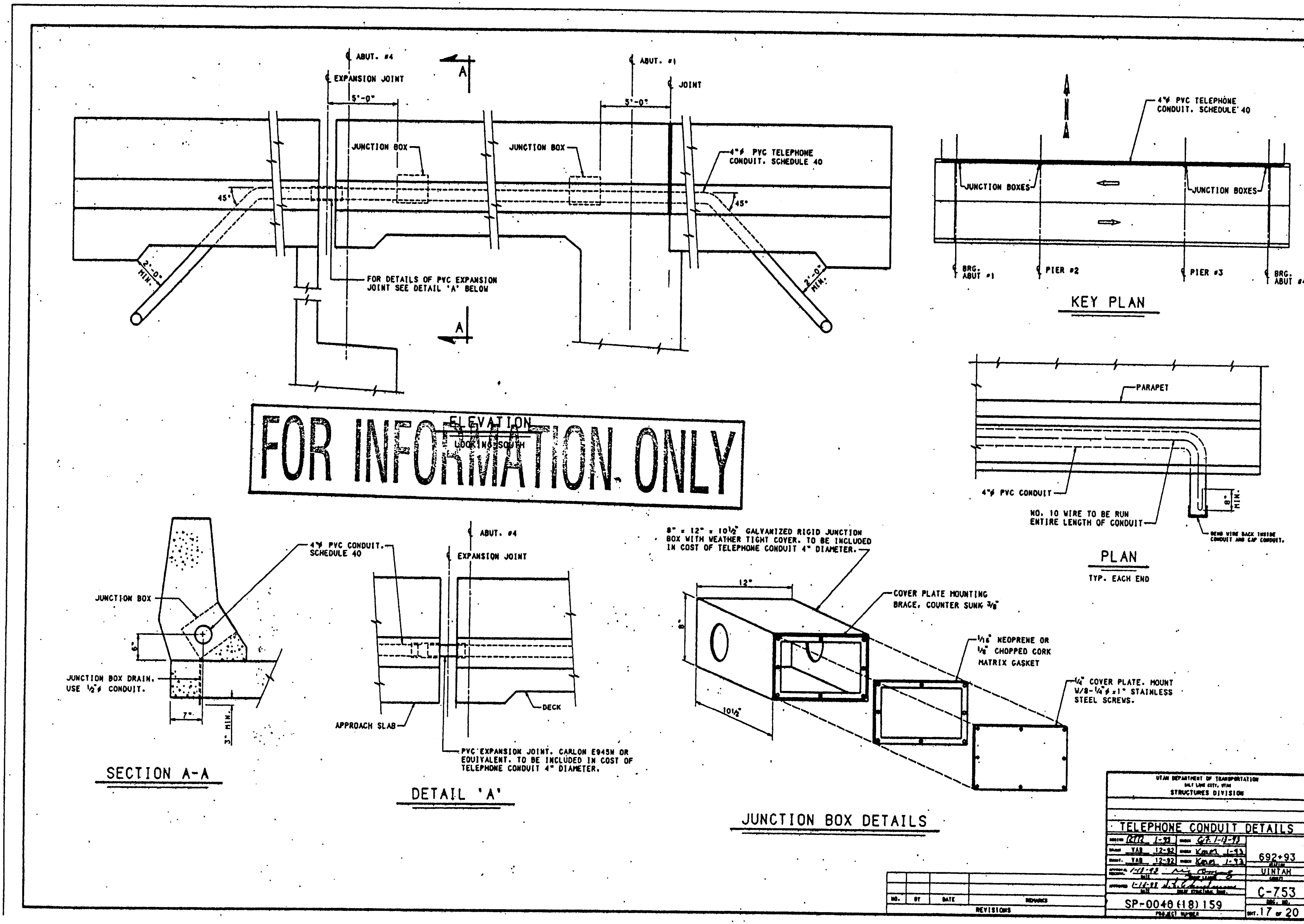
CONCRETE QUANTITIES FOR ALL PARAPET 139.4 Cu. Yds. CLASS AA(AE)

NO.	BY	DATE	REMARKS
			REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

PARAPET DETAILS

DESIGNED BTR 1-93	CHECKED GR 1-13-93		692+93
DRAWN VIDA-H JULY 93	CHECKED YAB AUG. 93		STATION
CHECKED VIDA-H JULY 93	CHECKED YAB AUG. 93		UINTAH
APPROVED 1-14-93			COUNTY
APPROVED 1-14-93			DRG. NO.
SP-0040 (18) 159			C-753
PROJECT NUMBER			SHT. 16 OF 20


FOR INFORMATION ONLY
ELEVATION
LOOKING SOUTH
ABUT. #4
EXPANSION JOINT
ABUT. #1
JOINT
5'-0"
JUNCTION BOX
4"φ PVC TELEPHONE CONDUIT. SCHEDULE 40
45°
2'-0" MIN.
FOR DETAILS OF PVC EXPANSION JOINT SEE DETAIL 'A' BELOW
A
KEY PLAN
4"φ PVC TELEPHONE CONDUIT. SCHEDULE 40
JUNCTION BOXES
BRG. ABUT #1
PIER #2
PIER #3
BRG. ABUT #4
PLAN
TYP. EACH END
PARAPET
4"φ PVC CONDUIT
NO. 10 WIRE TO BE RUN ENTIRE LENGTH OF CONDUIT
8" MIN.
BEND WIRE BACK INSIDE CONDUIT AND CAP CONDUIT.
SECTION A-A
4"φ PVC CONDUIT. SCHEDULE 40
JUNCTION BOX
JUNCTION BOX DRAIN. USE 1/2"φ CONDUIT.
6"
7"
3" MIN.
DETAIL 'A'
APPROACH SLAB
DECK
PVC EXPANSION JOINT. CARLON E945N OR EQUIVALENT. TO BE INCLUDED IN COST OF TELEPHONE CONDUIT 4" DIAMETER.
JUNCTION BOX DETAILS
8" x 12" x 10½" GALVANIZED RIGID JUNCTION BOX WITH WEATHER TIGHT COVER. TO BE INCLUDED IN COST OF TELEPHONE CONDUIT 4" DIAMETER.
12"
8"
10½"
COVER PLATE MOUNTING BRACE, COUNTER SUNK 3/8"
1/16" NEOPRENE OR 1/8" CHOPPED CORK MATRIX GASKET
1/4" COVER PLATE. MOUNT W/8-1/4"φ x 1" STAINLESS STEEL SCREWS.
UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION
TELEPHONE CONDUIT DETAILS
692+93
UINTAH
C-753
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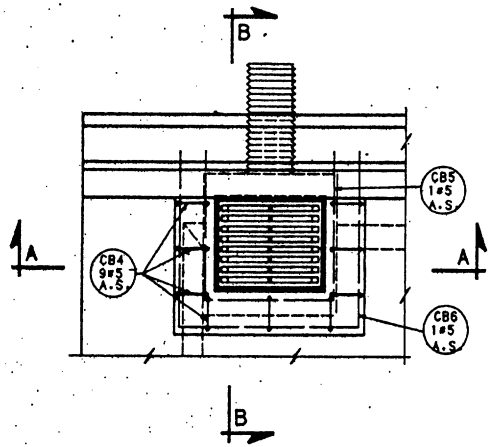
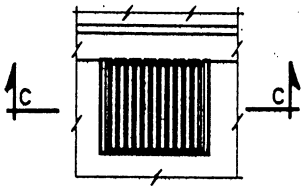
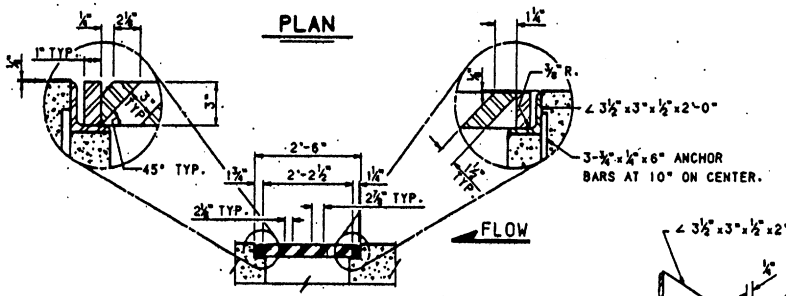
NOTE:
SEE QUANTITIES BELOW FOR TYPE OF GRATING REQ'D.



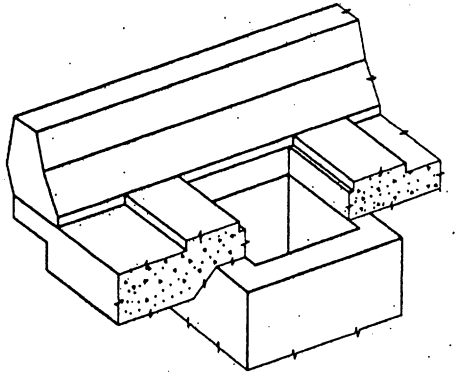
TYPICAL PLAN
(SHOWING STANDARD GRATE)



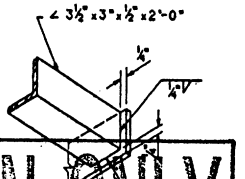
PLAN



SECTION C-C



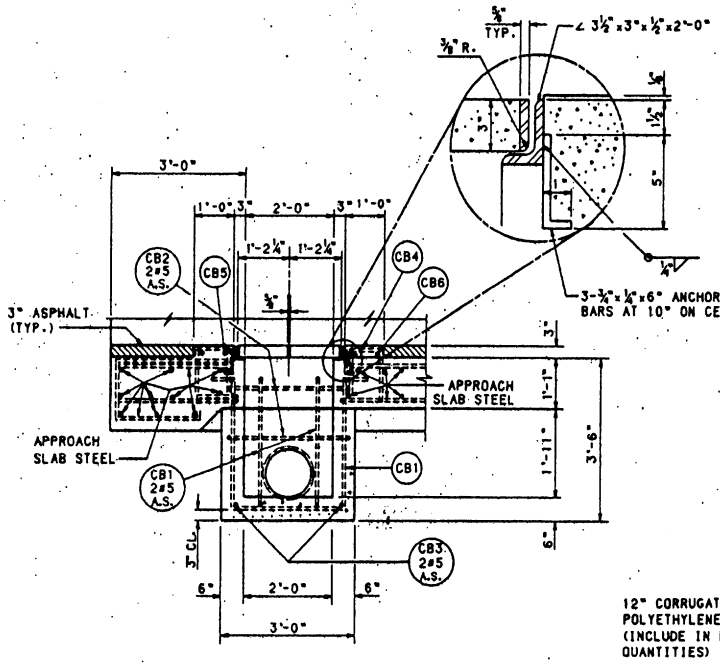
ISOMETRIC



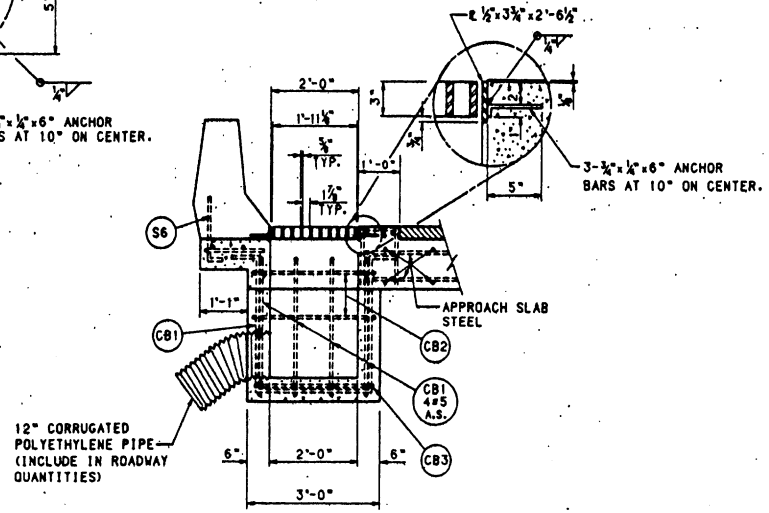
BICYCLE SAFE GRATE

FOR INFORMATION ONLY

GRATE FRAME DETAIL



SECTION A-A



SECTION B-B

GENERAL NOTES

1- APPROACH SLAB REINFORCING STEEL SHALL BE FIELD CUT OR BENT TO CLEAR APPROACH SLAB DRAINS SHOWN.

2- REINFORCING STEEL SHALL BE EPOXY COATED.

3- SEE DECK SHEET FOR ACTUAL LOCATIONS OF DRAINS.

QUANTITIES
CONCRETE CLASS AA(AE): 4 CATCH BASINS AT 0.5 CU. YDS EACH= 2.0 CU. YDS
STRUCTURAL STEEL: 4 BICYCLE SAFE GRATES AT 410 LBS EACH= 1640 LBS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

APPROACH SLAB DRAIN DETAILS

DESIGNED BTR 1-93	CHECKED G.R. 1-12-93		692+93
DRAWN YIDA-H AUG-92	CHECKED YAB 12-92		STATION
TRACED YIDA-H AUG-92	CHECKED YAB 12-92		UINTAH
APPROVED 1-14-93			COUNTY
			DRG. NO. C-753
			SHT. 18 OF 20

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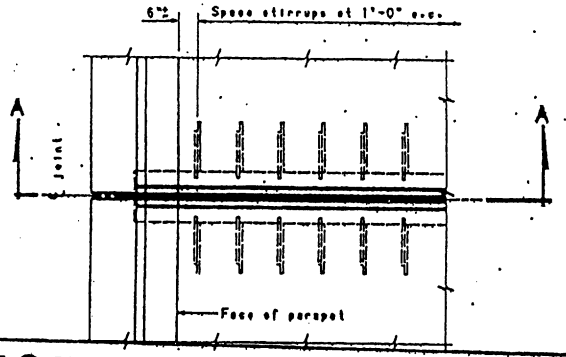
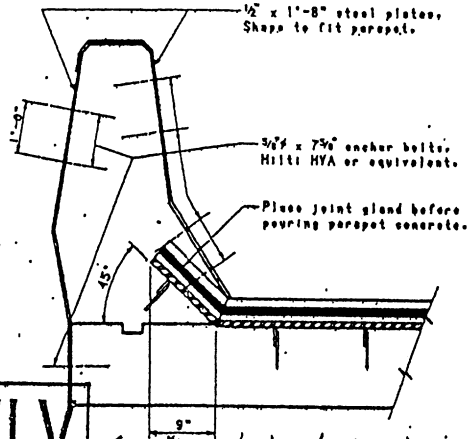
			REVISIONS

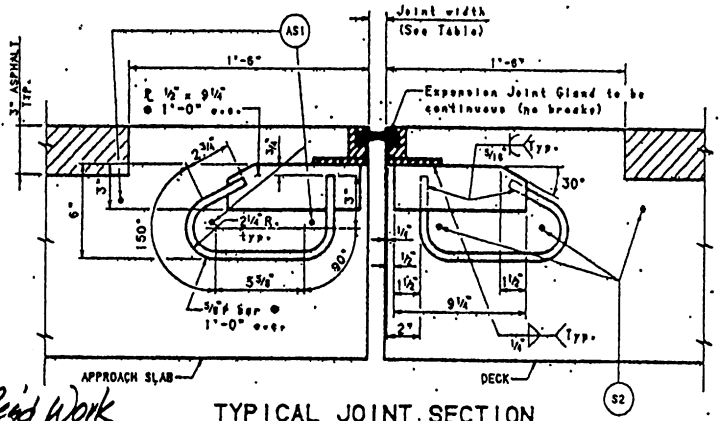
RATED CAPACITY	° TEMPERATURE	30°	40°	50°	60°	70°	80°	90°
5"	JOINT WIDTH	3½"	3"	2½"	2¼"	2"	1¾"	1½"



PLAN VIEW OF EXPANSION JOINT



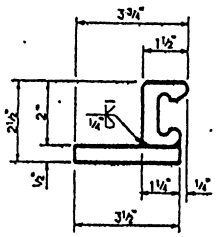
SECTION A-A



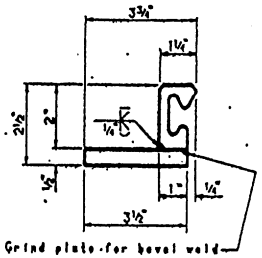
TYPICAL JOINT SECTION

FOR INFORMATION ONLY

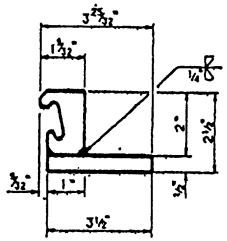
Except to indicate location of field work and Notes



D.S. BROWN STRIP SEAL SYSTEM
(USE LY SERIES SEAL ELEMENT)

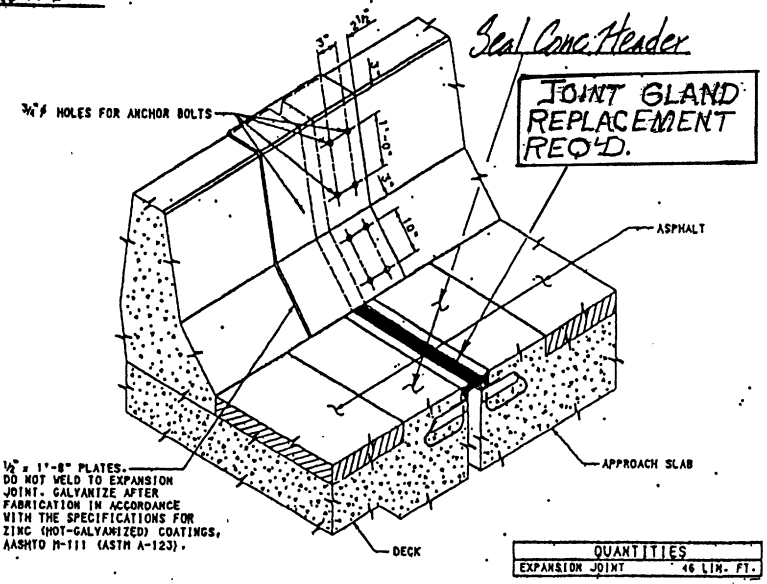


STRUCTURAL ACCESSORIES STRIP SEAL SYSTEM
(USE ONFLEX 500EQ SERIES SEAL ELEMENT)



WABO STRIP SEAL SYSTEM
(USE SE SERIES SEAL ELEMENT)

ALTERNATES FOR STEEL EXTRUSION SYSTEMS

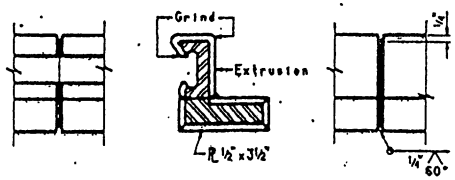


QUANTITIES	
EXPANSION JOINT	46 LIN. FT.

C-153R

LEFT ELEVATION TYPICAL SECTION RIGHT ELEVATION

STEEL EXTRUSION SPLICE DETAIL



LEFT ELEVATION TYPICAL SECTION RIGHT ELEVATION

Splice steel extrusion rails, splice ½" x 3½" plates, then weld rail to plate.

STEEL EXTRUSION RAIL AND PLATE SPLICE DETAIL

Notes:

1. Utilities are located in the parapets and other locations on the bridge, Contractor needs to field verify location and take measures to prevent damage during construction.
2. Field verify the existing steel extrusion system, use the correct type, size and length of gland replacement.
3. Remove & replace gland, and restore the parapets to original configuration.
4. The cost of sealing concrete header shall be included in the contract price for parapet sealing.

RWIS MATERIALS AND EQUIPMENT SCHEDULES

MATERIAL SCHEDULE
** FOR INFORMATION ONLY **

ITEM	QTY
POLYMER CONCRETE JUNCTION BOX TYPE II (EACH)	3
POLYMER CONCRETE JUNCTION BOX TYPE I (EACH)	1
2" CONDUIT SCHEDULE 40 PVC (LINEAR FOOT)	800
1/2" X 10' COPPER CLAD GROUND ROD (EACH)	4
3/4" ACORN GROUND ROD CLAMP (EACH)	4
CONCRETE - CLASS AA(AE) (CUBIC YARD)	1.5
6-6-10-10 STEEL MESH (SQUARE FOOT)	30
DETECTABLE PULL TAPE WITH INCREMENTAL MEASUREMENT MARKINGS (LINEAR FOOT)	800
2" PVC 90 DEGREE SWEEP (EACH)	3
1 1/2" PVC 90 DEGREE SWEEP (EACH)	1
1 1/2" CONDUIT SCHEDULE 40 PVC (FOOT)	10

STATE FURNISHED MATERIALS
** TO BE INSTALLED **

ITEM	QTY
STEEL TOWER BASE (EACH)	1
32 STRAND, #210 WEIGHT, 7/16" TINNED COPPER GROUND CABLE (SET)	1
GROUND ROD	6
3/4" ACORN CHIPS	6

GENERAL NOTES:

1. CONTRACTOR IS STRONGLY ENCOURAGED TO CAREFULLY READ, UNDERSTAND AND FOLLOW ALL DRAWINGS, SPECIFICATIONS AND MANUFACTURER'S MATERIALS REGARDING THE RWIS INSTALLATION. ALL DAMAGED OR INCORRECTLY INSTALLED EQUIPMENT WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE. CONTRACTOR IS RESPONSIBLE FOR ALL DELAYS WHICH MAY RESULT FROM DAMAGE OR IMPROPER INSTALLATION.

2. CONTRACTOR WILL PICK UP STATE-FURNISHED MATERIALS AT THE FOLLOWING ADDRESS:

   UTAH DEPARTMENT OF TRANSPORTATION
   TRAFFIC OPERATIONS CENTER (TOC)
   2060 SOUTH 2760 WEST
   SALT LAKE CITY, UTAH 84104-4592

NO.	DATE	DESIGN REV. BY	MAPS CORR. BY	PARCELS AFFECTED	REQUEST BY	REMARKS

DATE — ORIGINAL SUBMISSION FOR AUTHORIZATION

REVISIONS

REVIEW — DATE — BY

UDOT GOING THE EXTRA MILE

REGION 3 - OREM, UTAH
ROADWAY DESIGN

APPROVAL RECOMM. 06/16/03 [signature] DATE PROJECT DESIGN ENGINEER — DESIGN — CHECK
APPROVED [signature] DATE PRECONSTRUCTION ENGINEER — DRAWN — CHECK — QUANT. — CHECK

US-40 BRIDGES:
STARVATION RESERVOIR
& JENSEN BRIDGES

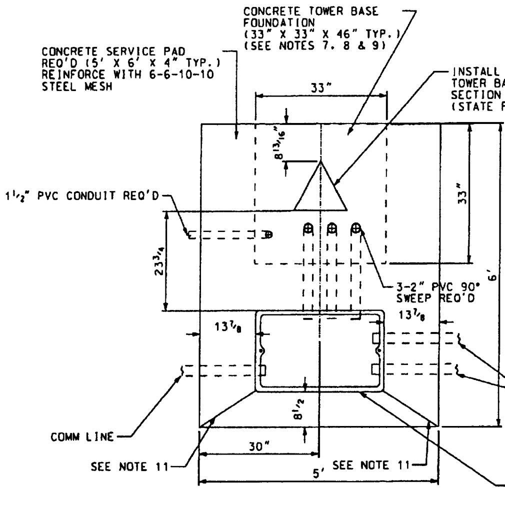
ROADWAY WEATHER INFORMATION SYSTEM
ENVIRONMENTAL SENSOR STATION (RWIS-ESS)

PROJECT NUMBER SP-0040(5)181

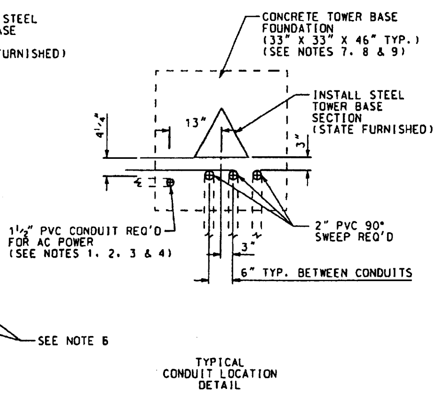
DUCHESNE
COUNTY

SHEET NO. WS-1

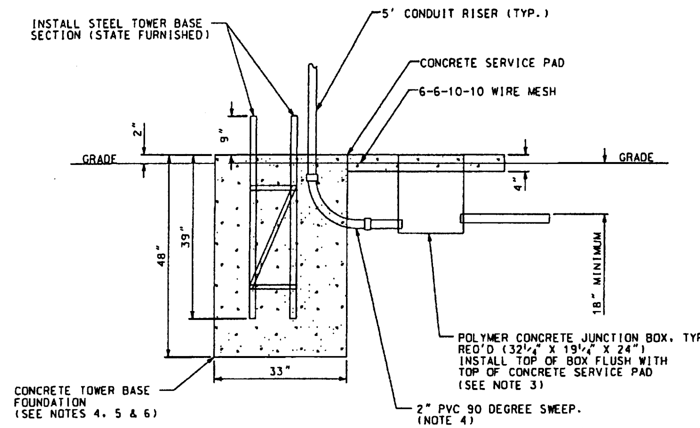
RPU TOWER BASE AND SERVICE PAD LAYOUT AND CONCRETE FORMING DETAILS



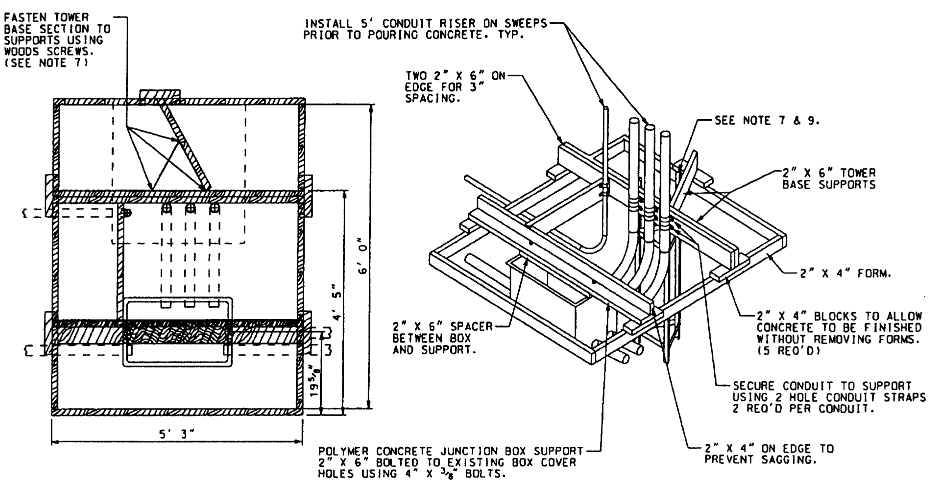
RPU TOWER BASE & SERVICE PAD INSTALLATION DETAIL



TYPICAL CONDUIT LOCATION DETAIL



RPU TOWER BASE & SERVICE PAD INSTALLATION DETAIL (LEFT SIDE VIEW)



RPU TOWER BASE & SERVICE PAD CONCRETE FORM DETAIL

NOTES:

1. ALL CONDUITS ARE SCHEDULE 40 PVC.
2. STUB OUT $1^1/_2$" CONDUIT INTO TYPE I JUNCTION BOX.
3 INSTALL JUNCTION BOXES AS PER STD DWG NO. AT 7.
4. INSTALL ALL CONDUITS IN TOWER BASE CONCRETE.
5. STUB OUT 2" CONDUIT FROM POLYMER CONCRETE JUNCTION BOX TO BEYOND SERVICE PAD FOR SENSOR CABLES. ORIENT TOWARD NEXT JUNCTION BOX AS APPROPRIATE.
6. CONCRETE, MINIMUM CLASS AA(AE).
7. THE TOP OF THE TOWER BASE SECTION MUST BE LEVEL. INSTALL TOP OF THE TOWER BASE 9" ABOVE THE CONCRETE PAD.
8. FINISH CONCRETE WITH A SLIGHT CROWN TO DRAIN WATER AWAY FROM CENTER
9. THE FORM DETAIL SHOWN IS TYPICAL FOR A FLAT SURFACE INSTALLATION. MODIFY AS APPROPRIATE FOR FIELD CONDITIONS.
10. CONTRACTOR IS RESPONSIBLE FOR INCORRECTLY INSTALLED OR DAMAGED STATE FURNISHED EQUIPMENT AND MATERIALS.
11. WHEN FINISHING CONCRETE SCORE A LINE FROM THE CORNER OF THE TYPE II JUNCTION BOX TO THE CORNER OF THE CONCRETE FOR AN EXPANSION JOINT.

NO.	DATE	DESIGN	REV. BY	MAPS CORR. BY	PARCELS AFFECTED	REQUEST BY	REMARKS
							ORIGINAL SUBMISSION FOR AUTHORIZATION

REVISIONS

UDOT GOING THE EXTRA MILE

REGION 3 - OREM, UTAH
ROADWAY DESIGN

APPROVAL RECOMM. 06/16/03 DESIGN CHECK REVIEW
DATE PROJECT DESIGN ENGINEER DRAWN CHECK DATE
APPROVED DATE PRECONSTRUCTION ENGINEER QUANT. CHECK BY

US-40 BRIDGES: STARVATION RESERVOIR & JENSEN BRIDGES

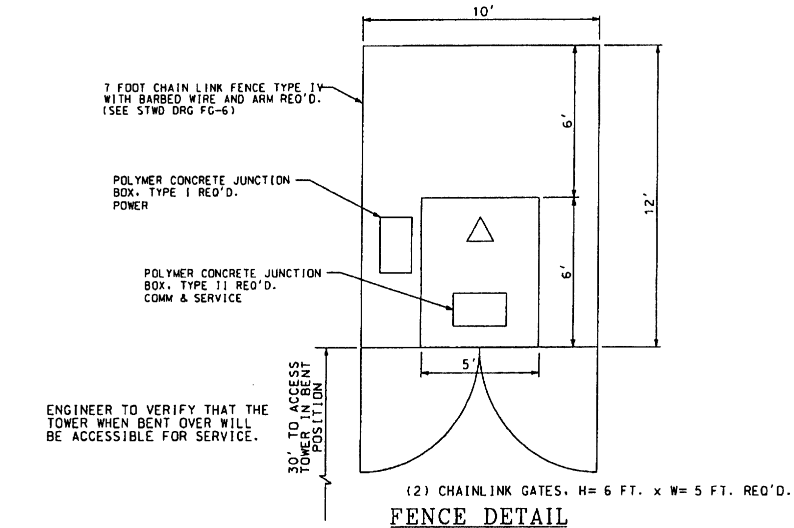
ROADWAY WEATHER INFORMATION SYSTEM
ENVIRONMENTAL SENSOR STATION (RWIS-ESS)

PROJECT NUMBER SP-0040(518)

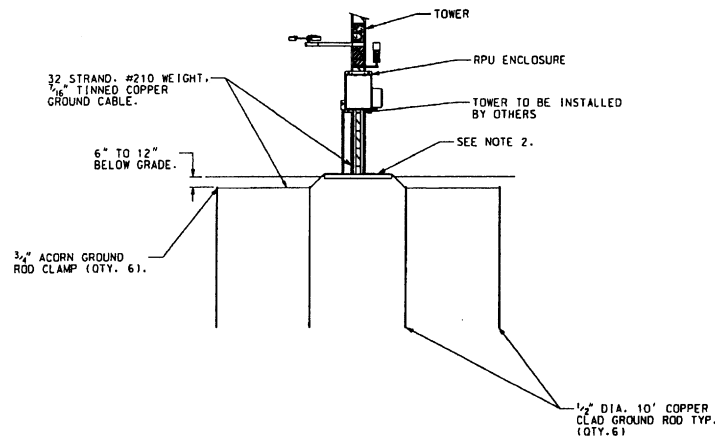
DUCHESNE COUNTY

SHEET NO. WS-2

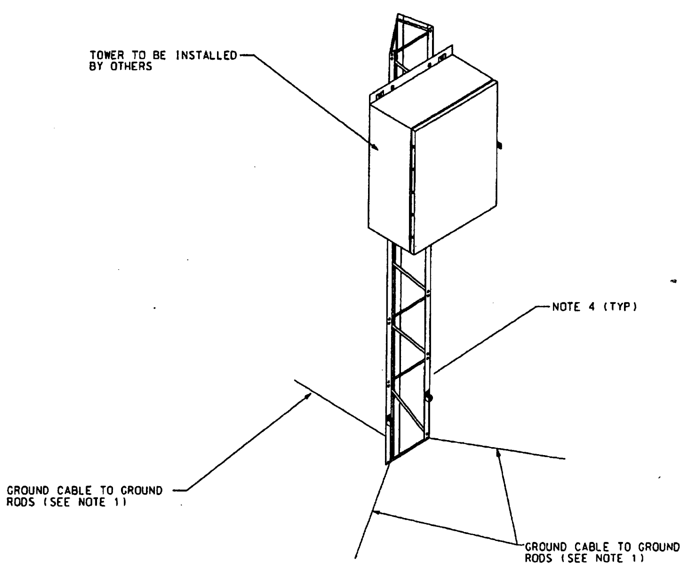
GROUND ROD INSTALLATION AND TOWER GROUNDING DETAIL



FENCE DETAIL



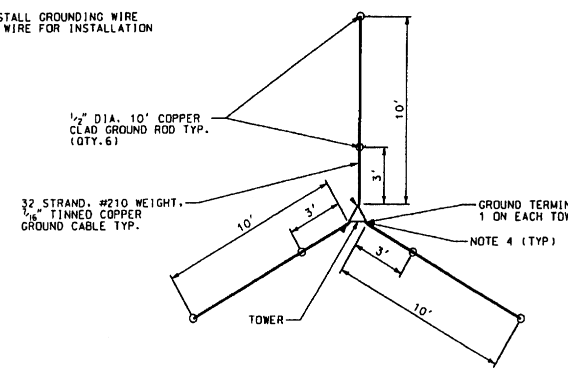
GROUND ROD INSTALLATION DETAIL (PROFILE VIEW)



GROUND CABLE TERMINATION DETAIL

NOTES:

1. DO NOT INSTALL GROUND CABLES IN CONCRETE PAD, RUN ON TOP.
2. ANCHOR GROUND CABLES FLAT AGAINST CONCRETE PAD WITH SUITABLE CLAMPS/ANCHORS. LEAVE EXCESS WIRE TO BE ATTACHED TO TOWER BY OTHERS
3. DUCT SEAL UNDERGROUND CONDUIT OPENING AFTER INSTALLING GROUND WIRE.
4. ON ALL THREE LEGS, CONTRACTOR TO INSTALL GROUNDING WIRE AND RODS. COIL AND LEAVE 10 FEET OF WIRE FOR INSTALLATION BY OTHERS.



GROUND ROD INSTALLATION DETAIL (PLAN VIEW)

NO.	DATE	DESIGN REV. BY	MAPS CORR. BY	PARCELS AFFECTED	REQUEST BY	REMARKS	
	DATE	ORIGINAL SUBMISSION FOR AUTHORIZATION					

REVISIONS

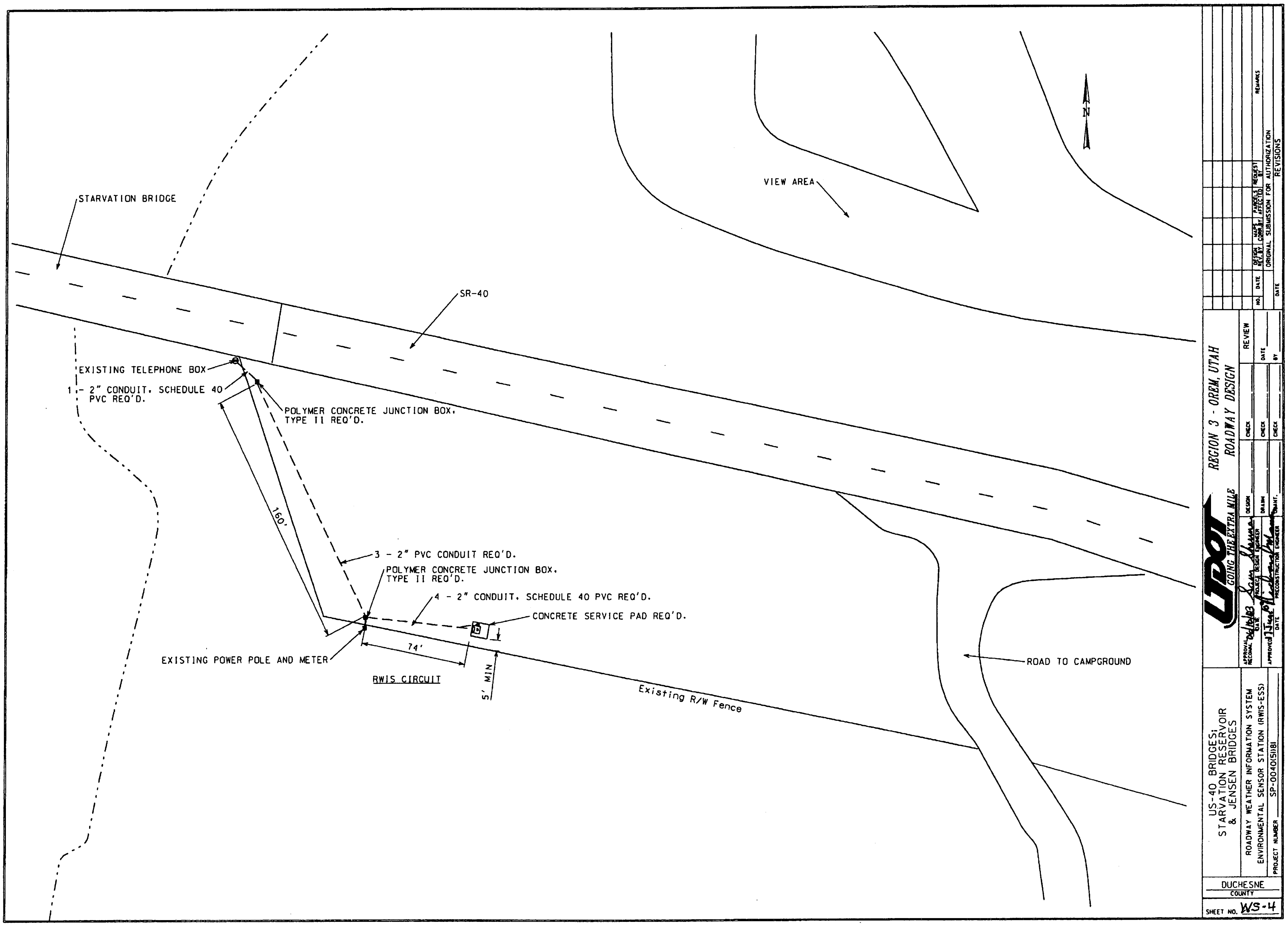
REGION 3 - OREM, UTAH
ROADWAY DESIGN

UDOT GOING THE EXTRA MILE

APPROVAL RECOMM. DATE 6/16/03 PROJECT DESIGN ENGINEER — DESIGN — CHECK
APPROVED DATE PRECONSTRUCTION ENGINEER — DRAWN — CHECK
QUANT. — CHECK
REVIEW DATE BY

US-40 BRIDGES: STARVATION RESERVOIR & JENSEN BRIDGES
ROADWAY WEATHER INFORMATION SYSTEM
ENVIRONMENTAL SENSOR STATION (RWIS-ESS)
PROJECT NUMBER SP-0040(5)181

DUCHESNE COUNTY
SHEET NO. WS-3


STARVATION BRIDGE
SR-40
VIEW AREA
N
EXISTING TELEPHONE BOX
1 - 2" CONDUIT, SCHEDULE 40 PVC REQ'D.
POLYMER CONCRETE JUNCTION BOX, TYPE II REQ'D.
160'
3 - 2" PVC CONDUIT REQ'D.
POLYMER CONCRETE JUNCTION BOX, TYPE II REQ'D.
4 - 2" CONDUIT, SCHEDULE 40 PVC REQ'D.
CONCRETE SERVICE PAD REQ'D.
EXISTING POWER POLE AND METER
74'
RWIS CIRCUIT
5' MIN
Existing R/W Fence
ROAD TO CAMPGROUND
REGION 3 - OREM, UTAH
ROADWAY DESIGN
UDOT GOING THE EXTRA MILE
REVIEW
US-40 BRIDGES; STARVATION RESERVOIR & JENSEN BRIDGES
ROADWAY WEATHER INFORMATION SYSTEM
ENVIRONMENTAL SENSOR STATION (RWIS-ESS)
PROJECT NUMBER SP-0040(5)181
DUCHESNE COUNTY
SHEET NO. WS-4
ORIGINAL SUBMISSION FOR AUTHORIZATION
REVISIONS

XIII. Standard Drawing Index

(Change Three, Dated 06/02/03)

UTAH DEPARTMENT OF TRANSPORTATION

U	NUMBER	TITLE	CURRENT DATE
		Advanced Traffic Management System (AT)	
U	AT 1	Legend Sheet	07/03/02
	AT 2	Ramp Meter Details	07/03/02
	AT 3	Ramp Meter Sign Panel	07/03/02
	AT 4	Typical Ramp Meter Signal Head Mounting	07/03/02
	AT 5	Loop Installation	07/03/02
U	AT 6	Conduit Details	07/03/02
U	AT 7	Polymer-Concrete Junction Box Details	04/24/03
	AT 8	ATMS Cabinet w/120V Disconnect	07/03/02
	AT 9	ATMS Cab With Stepdown Transformer	07/03/02
	AT 10	Domed CCTV Details	07/03/02
	AT 11	CCTV Pole Detail	07/03/02
	AT 12	CCTV Pole Foundation For Dedicated CCTV Pole	07/03/02
	AT 13	120V VMS Cab Foundation Details	07/03/02
	AT 14	Weigh In Motion Piezo Detail	07/03/02
		Barriers (BA)	
U	BA 1A	Precast Concrete Full Barrier Standard Section	12/19/02
	BA 1B	Precast Concrete Full Barrier Standard Section	12/19/02
U	BA 2	Precast Concrete Half Barrier Standard Section	07/03/02
	BA 3	Cast In Place Constant Slope Barrier	12/19/02
	BA 4	Beam Guardrail Hardware	07/03/02
	BA 4A	Guardrail Transition	07/03/02
	BA 4B	Beam Guardrail Installation	12/19/02
	BA 4C	Beam Guardrail Anchor Type I	12/19/02

U	NUMBER	TITLE	CURRENT DATE
	BA 5	Traffic Control Cable	07/03/02
		Catch Basins and Cleanouts (CB)	
	CB 1	Standard Catch Basin	07/03/02
	CB 2	Curb Inlet Catch Basin	04/24/02
	CB 3	Standard Transition Concrete Lined Ditch To Pipe Or Diversion Box	07/03/02
	CB 4	Solid Cover For Standard Drawing DB 1 MS-18 Loading	07/03/02
	CB 5	Standard Screw Gate And Frame	07/03/02
	CB 6A	Standard Drop Inlet Details General Notes And Installation Detail	07/03/02
	CB 6B	Standard Catch Basin And Cleanout Box Drop Inlet Type "A" Details	07/03/02
	CB 6C	Standard Catch Basin And Cleanout Box Drop Inlet Type "B" Details	07/03/02
	CB 6D	Standard Catch Basin And Cleanout Box Drop Inlet Type "C" Details	07/03/02
	CB 6E	Standard Catch Basin And Cleanout Box Drop Inlet With Attached Apron Details	07/03/02
	CB 6F	Standard Catch Basin And Cleanout Box Drop Inlet With Attached Apron Details	07/03/02
	CB 6G	Standard Catch Basin And Cleanout Box Drop Inlet Type "D" Details	07/03/02
	CB 6H	Standard Catch Basin And Cleanout Box Drop Inlet Type "D" Tables	07/03/02
	CB 7	Standard Curb And Gutter Drop Inlet	07/03/02
	CB 8A	Double Catch Basin	07/03/02
	CB 8B	Double Catch Basin	07/03/02
	CB 9A	Standard Catch Basin and Cleanout Box Situation & Layout	07/03/02
	CB 9B	Standard Catch Basin and Cleanout Box Section Details	07/03/02
	CB 9C	Standard Catch Basin and Cleanout Box Schedule Of Installation 18" to 42" RCP 12" to 48" CMP	07/03/02
	CB 9D	Standard Catch Basin and Cleanout Box Schedule Of Installation 48" to 66" RCP 60" to 78" CMP	07/03/02
	CB 10A	Standard Catch Basin and Cleanout Box Situation & Layout	07/03/02
	CB 10B	Standard Catch Basin and Cleanout Box Section Details	07/03/02

U	NUMBER	TITLE	CURRENT DATE
	CB 10C	Standard Catch Basin and Cleanout Box Schedule Of Installation 42" to 60" RCP 48" to 72" CMP	07/03/02
		Crash Cushions (CC)	
U	CC 1	Crash Cushion Markings	07/03/02
U	CC 2	Crash Cushion Drainage Details Guideline A	07/03/02
U	CC 3	Crash Cushion Drainage Details Guideline B	07/03/02
U	CC 4	Details For Placement Crash Cushions Type A, B, & D	07/03/02
U	CC 5	Grading And Placement Detail Crash Cushion Type C	07/03/02
U	CC 6	Crash Cushion Type E Sand Barrel Details	12/19/02
U	CC 7	Grading & Installation Details Crash Cushion Type F	04/24/03
U	CC 8	Grading & Installation Details Crash Cushion Type G	04/24/03
U	CC 9A	Grading & Installation Details Crash Cushion Type H	04/24/03
U	CC 9B	Grading & Installation Details Crash Cushion Type H	04/24/03
		Diversion Boxes (DB)	
	DB 1A	Standard Diversion Box/Cover Plate/Grating For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1B	Standard Diversion Box Hinged Lid Details For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1C	Standard Diversion Box Bicycle - Safe Grating Details For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1D	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1E	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1F	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 2A	Standard Diversion Box w/Interchangeable Walls, Bottom Slab, Walls and Apron Detail	07/03/02
	DB 2B	Standard Diversion Box w/Interchangeable Walls, Quantities Schedule	07/03/02
	DB 2C	Standard Diversion Box w/Interchangeable Walls, Hand Slide Gate Details	07/03/02
	DB 2D	Standard Diversion Box Type "G" Hand Slide Details	07/03/02
	DB 2E	Standard Diversion Box Hinged Lid (Solid Cover Plate) Type "A" Details Type I Plan	07/03/02
	DB 2F	Standard Diversion Box Hinged Lid (Solid Cover Plate) Type "A" Details Type II Plan	07/03/02

U	NUMBER	TITLE	CURRENT DATE
	DB 2G	Standard Diversion Box Hinged Lid Solid Cover Type "B" Details	07/03/02
	DB 2H	Standard Diversion Box Hinged Lid Solid Cover Type "B" & "C" Details	07/03/02
	DB 3A	Standard Diversion Box With Manhole Cover Situation And Layout	07/03/02
	DB 3B	Standard Diversion Box With Manhole Cover Up To 42" RCP and Up To 54" CMP	07/03/02
	DB 3C	Standard Diversion Box With Manhole Cover 48" - 72" RCP and 60" to 84" CMP	07/03/02
		Drainage (DG)	
	DG 1	Fill Height for Metal Pipe (Steel)	07/03/02
	DG 2	Fill Height for Metal Pipe (Aluminum)	07/03/02
	DG 3	Maximum Fill Height and End Sections For HDPE and PVC Pipes	12/19/02
	DG 4	Pipe Culverts Minimum Cover	12/19/02
	DG 5	Plastic Pipe, Metal Pipe or Pipe Arch Culvert Bedding	07/03/02
	DG 6	Precast Concrete Pipe Culvert	07/03/02
	DG 7	Gasketted Joints or Coupling Bands for C.M.P.	07/03/02
	DG 8	Metal Culvert End Sections	07/03/02
	DG 9	Miscellaneous Pipe Details	07/03/02
		Environmental Controls (EN)	
	EN 1	Temporary Erosion Control (Check Dams)	07/03/02
	EN 2	Temporary Erosion Control (Silt Fence)	04/24/03
	EN 3	Temporary Erosion Control (Slope Drain and Temporary Berm)	07/03/02
	EN 4	Temporary Erosion Control (Drop Inlet Barriers)	12/19/02
	EN 5	Temporary Erosion Control (Sediment Trap and Curb Inlet Barrier)	07/03/02
		Fence and Gates (FG)	
	FG 1A	Right-of-Way Fence and Gates (Wood Posts)	07/03/02
	FG 1B	Right-of-Way Fence and Gates (Wood Posts)	07/03/02
	FG 2A	Right-of-Way Fence and Gates (Metal Posts)	07/03/02
	FG 2B	Right-of-Way Fence and Gates (Metal Posts)	07/03/02

U	NUMBER	TITLE	CURRENT DATE
	FG 3	Swing Gates Type I for Gates Less Than 17'	07/03/02
	FG 4	Deer Gates	07/03/02
	FG 5	Swing Gates Type II for Gates Wider Than 17'	07/03/02
U	FG 6	Chain Link Fence	07/03/02
		Grates, Frames, and Trash Racks (GF)	
	GF 1	Manhole Frame And Grated Cover	07/03/02
	GF 2	Manhole Frame And Solid Cover	07/03/02
	GF 3	Rectangle Grate & Frame	07/03/02
	GF 4	Directional Flow Grate & Frame	07/03/02
	GF 5	Solid Cover & Frame	07/03/02
	GF 6	Manhole Steps	07/03/02
	GF 7	Standard Screw Grate & Frame	07/03/02
	GF 8	2' x 2' Grate & Frame	07/03/02
	GF 9	28" x 24" Directional Flow and Frame	07/03/02
	GF 10	Standard Trash Racks 90E X-ing L	07/03/02
	GF 11	Standard Trash Racks	07/03/02
	GF 12	Standard Trash Racks	07/03/02
		General Road Work (GW)	
	GW 1	Raised Median and Plowable End Section	12/19/02
	GW 2	Concrete Curb and Gutter	04/24/03
	GW 3	Concrete Curb and Gutter Details	07/03/02
	GW 4	Concrete Driveways and Sidewalks	07/03/02
	GW 5	Pedestrian Access	02/27/03
	GW 6	Right-of-Way Marker	07/03/02
	GW 7	Newspaper and Mailbox Stop Layout	07/03/02
	GW 8	Newspaper and Mailbox Support Hardware	07/03/02
U	GW 9	Delineation Hardware	07/03/02
	GW 10	Delineation Application	07/03/02
		Paving (PV)	

U	NUMBER	TITLE	CURRENT DATE
	PV 1	Joints for Highways with Concrete Traffic Lanes and Shoulders	07/03/02
	PV 2	Pavement/Approach Slab Details	12/19/02
	PV 3	Concrete Pavement Details for Urban and Interstate	07/03/02
	PV 4	Concrete Pavement Details for Urban and Interstate	07/03/02
	PV 5	Urban Concrete Pavement Details	07/03/02
	PV 6	Rumble Strips	07/03/02
	PV 7	Rumble Strips - Typical Application	07/03/02
		Signals (SL)	
	SL 1	Traffic Signals Mast Arm Pole and Luminaire Extension	07/03/02
	SL 2	Traffic Signals Mast Arm Detail 25' Thru 65'	07/03/02
	SL 3	Underground Service Pedestal Details	07/03/02
	SL 4	Traffic Signals Mast Arm Pole Foundation	07/03/02
	SL 5	Breakaway Post Mounted Traffic Signal Pole	07/03/02
	SL 6	Power Source Details	07/03/02
	SL 7	Span Wire Signal Pole Detail	07/03/02
	SL 8	Signal Head Details	07/03/02
	SL 9	Pedestrian Signal Assembly	07/03/02
	SL 10	Controller Base Details	07/03/02
	SL 11	Traffic Signals Loop Detector Detail	07/03/02
	SL 12	Junction Box Details	07/03/02
	SL 13	Traffic Counting Loop Detector Detail	12/19/02
	SL 14	Light Pole Breakaway Base	07/03/02
	SL 15	Luminaire Breakaway Base Detail	07/03/02
	SL 16	Single Transformer Substation Details	07/03/02
	SL 17	Light Pole Anchor Base	07/03/02
	SL 18	Light Pole Foundation Extension	07/03/02
		Signs (SN)	
	SN 1	Bridge Load Limit Signs	07/03/02
	SN 2	Flashing School Sign	12/19/02

U	NUMBER	TITLE	CURRENT DATE
	SN 3	Overhead School Flasher	07/03/02
	SN 4	Flashing Stop Sign	12/19/02
	SN 5	Typical Installation for Milepost Signs	12/19/02
	SN 6	Not Used	
U	SN 7	Placement of Ground Mounted Signs	07/03/02
U	SN 8	Ground Mounted Timber Sign Post (P1)	12/19/02
U	SN 9	Ground Mounted Tubular Steel Sign Post (P2)	07/03/02
U	SN 10	Ground Mounted Square Steel Sign Post (P3)	07/03/02
	SN 11	Slipbase Ground Mounted Tubular Steel Sign Post (P4)	07/03/02
	SN 12A	Ground Mounted Sign Installation Details	07/03/02
	SN 12B	Ground Mounted Sign Installation Details	04/24/03
	SN 12C	Ground Mounted Sign Installation Details	07/03/02
		Striping (ST)	
	ST 1	Object Markers "T" Intersection & Pavement Transition Guidance	12/19/02
	ST 2	Freeway Turn Around Markings	07/03/02
U	ST 3	Typical Pavement Markings	07/03/02
	ST 4	Crosswalks, Parking and Intersection Approaches	07/03/02
	ST 5	Painted Median & Auxiliary Lane Details	07/03/02
	ST 6	Passing/Climbing Lanes Traffic Control	07/03/02
	ST 7	Pavement Markings & Signs at Railroad Crossing	12/19/02
	ST 8	Plowable Pavement Markers	07/03/02
		Structures and Walls (SW)	
	SW 1A	Welded End Guard Unit	07/03/02
	SW 1B	Precast Concrete Cattle Guard	07/03/02
	SW 2	Noise Wall Placement Area	07/03/02
	SW 3A	Precast Concrete Noise Wall 1 of 2	12/19/02
	SW 3B	Precast Concrete Noise Wall 2 of 2	12/19/02
	SW 4A	Precast Concrete Retaining/Noise Wall 1 of 2	12/19/02

U	NUMBER	TITLE	CURRENT DATE
	SW 4B	Precast Concrete Retaining/Noise Wall 2 of 2	07/03/02

		Traffic Control (TC)	
U	TC 1A	Construction Zone Channelization Devices	07/03/02
U	TC 1B	Construction Zone Signing	07/03/02
U	TC 2A	Traffic Control General	07/03/02
U	TC 2B	Traffic Control General	07/03/02
U	TC 3	Traffic Control Project Limit Signing	07/03/02
	TC 4	Traffic Control Urban Intersections With Roadways Under 50 MPH	07/03/02
	TC 5	Traffic Control Urban Intersections With Roadways Under 50 MPH	07/03/02
	TC 6	Traffic Control Pedestrian Routing	07/03/02
U	TC 7	Traffic Control Road Closed, Detour	07/03/02
U	TC 8	Traffic Control Lane Closure	07/03/02
	TC 9	Traffic Control Multilane Closure	07/03/02
	TC 10	Traffic Control Expressway And Freeway Crossover/Turn-Around	07/03/02
	TC 11	Traffic Control Exit Ramp Gore	07/03/02
	TC 12	Traffic Control Entrance Ramp Gore	07/03/02
U	TC 13	Traffic Control Shoulder-Haul Road	07/03/02
U	TC 14	Traffic Control Flagging Operation	07/03/02
U	TC 15	Traffic Control 2 Lane/ 2 Way Seal Coat With Cover Material	07/03/02
U	TC 16	Traffic Control Pavement Marking	07/03/02

XIV. Special Provisions

April 10, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 00250S

PREBID CONFERENCE

PART 1 GENERAL

1.1 SCHEDULING

A. A mandatory Pre-Bid Conference will be held at the following time and location:

Date: July 15, 2003 Time: 2:00 p.m.

Location: Region 3 Office, 658 North 1500 West, Orem, Utah

Project ID: SP-0040(51)81

B. Representatives of Construction and Design will be present to discuss details related to this project.

C. Bids submitted by Contractors who did not attend the pre-bid conference will be non-responsive.

PART 2 PRODUCTS **Not Used**

PART 3 EXECUTION **Not Used**

END OF SECTION

June 6, 2003

SPECIAL PROVISION

SP – 0040(51)81

SECTION 00555M

PROSECUTION AND PROGRESS

PART 1 GENERAL

1.1 RELATED SECTIONS

Add the following to 1.12, Limitation of Operations

D. The Contractor shall also inform the traveling public of upcoming work one week prior to the start of construction with Variable Message Signs. The message will be determined by the Resident Engineer.

Scheduling of work shall be approved by the Project Engineer prior to beginning any portion of this project. No work or lane restrictions will be allowed on holidays or the day preceding and following a holiday and any special events as determined by the Engineer.

May 22, 2003

SPECIAL PROVISION

SP – 0040(51)81

SECTION 01355M

ENVIRONMENTAL PROTECTION

Add the following to paragraph 1.4, Live Streams:

D. Conduct work operations such that no debris, trash, or other foreign object enters any waterway. Develop and submit to the engineer an action plan that will meet this requirement. Educate workers on the importance of debris, trash, and foreign object control prior to beginning work. If debris, trash and foreign object control enters any waterway, the Engineer reserves the right to suspend work and require the contractor to submit a new action plan. The engineer reserves the right to dismiss any employee from the project who negligently allows debris, trash, or any foreign object to enter any waterway.

June 4, 2003

SPECIAL PROVISION

SP – 0040(51)81

SECTION 01554S

TRAFFIC CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Traffic Control Plan requirements, and materials and labor necessary for implementation.

B Traffic Control Maintainer and Flagging.

C. Work zone traffic control devices, advance warning arrow panels, and pilot cars.

1.2 RELATED SECTIONS

A. Section 00555: Prosecution and Progress.

B. Section 00725: Scope of Work

C. Section 00727: Control of Work

D. Section 01558: Temporary Pavement Markings

E. Section 02842: Delineators.

F. Section 02891: Traffic Signs

G. Section 02765: Pavement Marking Paint

1.3 REFERENCES

A. AASHTO Roadside Design Guide, Current Edition

B. Manual on Uniform Traffic Control Devices (MUTCD), Current Edition

C. ATSSA: American Traffic Safety Services Association.
   1. Quality Standards for Work Zone Traffic Control Devices

D. NCHRP- Report 350 Recommended Procedures for the Safety Performance Evaluation of Highway Features

1.4 BIDDING REQUIREMENTS

A. The apparent low bidder:
   1. Submit three copies of the Traffic Control Plan to the Engineer no later than the fourth Wednesday following bid opening. Submit plans in 11 inches x 17 inches format prepared using CAD software. All plans must be signed and sealed by a professional engineer licensed in the State of Utah. When available, the Department will provide basemap CAD files in Microstation format to the Contractor on a CD-ROM at no cost.
   2. Attend a mandatory meeting at the time and location as directed by the Engineer:
      a. Contractor's Traffic Control Designer
      b. Contractor's Traffic Control Maintainer
      c. Resident Engineer
      d. Region Traffic Engineer or designated representative
   3. Ensure compliance with the plans and specifications. Modify plan if necessary to meet all applicable requirements.
   4. The Department will grant no additional contract time for preparing or modifying the Traffic Control Plan.
   5. Do not begin work until the Traffic Control Plan is implemented for that phase of work. Do not implement traffic control until written authorization is received from the Engineer.
   6. **Work done by the Department for installation of RWIS site shall be covered under the Contractors Traffic Control Plan. Coordination must be made with the UDOT ITS Department as to traffic control measures needed and scheduling of activities**.

1.5 CERTIFICATIONS

A. After April 1, 2002, use devices and systems which meet NCHRP-350 Report crash test requirements as defined in the four categories by the Federal Highway Administration. Some exceptions will be acceptable as stated below.
   1. Category 1: Cones, tubular marker, delineators, and drums without lights must be certified by the manufacturer as meeting NCHRP-350 Report requirements.

2. Category 2: Portable sign stands with signs, Type I, II and III barricades, vertical panels, Category 1 devices with light attachments and devices not expected to cause significant vehicle velocity change. These devices and systems must be certified by FHWA as meeting NCHRP-350 Report test requirements.
3. Category 3: Portable/Temporary pre-cast concrete barrier manufactured after October 1, 2002 must be certified as meeting NCHRP-350 Report test requirements.
    a. Manufactured date to be stamped into top of each barrier section using a numeric format (ex: 10/2002) with 2 inch x 2 inch numerals, 1/4 inch deep. See Standard Drawing BA 1A and BA 2.
    b. Portable/Temporary pre-cast concrete barrier manufactured prior to October 1, 2002 and meeting NCHRP 230 may be used until they are no longer serviceable.
4. Category 3: Crash Cushions and Truck Mounted Attenuators must be certified by FHWA as meeting NCHRP-350 Report test requirements.
    a. The appropriate GREAT CZ, manufactured by Energy Absorption Systems, may be used until they have completed their normal service life.
5. Category 4: Advanced Warning Arrow Panels and portable variable message signs do not have to meet NCHRP-350 Report test requirements.

1.6 TRAFFIC CONTROL PLAN REQUIREMENTS

A. Design Traffic Control Plan resolving discrepancies between the various standards for traffic control in accordance with Section 00727 Control of Work article 1.5 B and the following:
    1. UDOT Standard Traffic Control Drawings TC series, and UDOT Standard Drawings SN 7, SN 8, SN 9, and SN 10 for post mounted signs.
    2. Manual on Uniform Traffic Control Devices (MUTCD) Current Edition

B. Follow the requirements and limitations identified in the Traffic Control Special Provision (if included), Section 00555, Prosecution and Progress, article 1.11, Limitation of Operations, Section 00725, Scope of Work, articles associated with the maintaining of traffic and Section 00820 Legal Relations and Responsibility to Public, article 1.10 “Public Convenience and Safety - Traffic and Pedestrians.”

C. Consider the safe and efficient movement of traffic when lane closures are proposed.
    1. Open lanes to traffic wherever and whenever practical.
    2. Minimize and restrict lane closures to the locations and times essential for prosecution of work.

D. Provide for concrete barrier and attenuation to satisfy hazard mitigation according to UDOT Standard Drawing TC 2A Detail AA, and Standard Drawing TC 7, Detail TC 7-1.

E. Provide for delineation and temporary pavement markings and/or removal as needed for traffic control or as required in accordance with this Section, article 1.6, paragraphs H and I.

F. Provide concrete barrier or other positive protection for all hazards (ie: bridge parapets, barrier blunt ends, poles, large equipment to include but not limited to cranes, pile drivers etc.) when hazard is within AASHTO clear zone requirements for approach traffic.

G. Use the following format and provide the following documentation:
   1. Section I: Description of each phase
      a. List phases, and corresponding bid items and elements of work to be accomplished in each phase.
      b. Accounting for each contract bid item and element of work, reference the traffic control detail designed to provide for the safe and efficient movement of traffic and safety of workers.
      c. All contract bid items and elements of work must be identified and included in the phasing.
   2. Section II: CAD generated drawings showing detailed Traffic Control Plan for each phase:
      a. Adapt Standard Drawings and work zone traffic control examples contained in the MUTCD to reflect actual project conditions such as curves, grades, presence of ramps, intersections and accesses.
      b. Use basemap CAD files when supplied by the Department as a basis for the Traffic Control Plan drawings.
      c. Use the same level of detail as in the MUTCD and UDOT Standard Traffic Control Drawings.
      d. Include the anticipated duration of the traffic control setup used in each phase.
      e. Provide for the safe passage of pedestrians and bicyclists through the work zone in accordance with the Americans with Disabilities Act and the MUTCD.
      f. Clearly indicate the following:
         - Proposed regulatory speed reductions in accordance with this Section, article 3.6
         - For all tapers: length of taper, device spacing, lane or shoulder closures, amount of lane shift in accordance with this Section, article 3.3, paragraph A
         - Length of buffer zone, in accordance with this Section, article.3.3, paragraph A
         - Device spacing used in tangents in accordance with this Section, 3.3, paragraph B

- Lengths of work zones, lane and shoulder widths and area available for vehicle recovery
- Proposed changes to be made to existing traffic signals including: timing changes, phase changes, etc.
- Sign locations for required and existing signs.
- Existing signs that are to be removed, covered, relocated or otherwise changed from the original configuration.
- Worker parking, work vehicle and equipment access to and from work area, staging and material sites.

3. Section III: Emergency and Special Situations
   a. Identify procedures for dealing with emergencies and special situations.

H. Provide temporary pavement markings on newly constructed asphalt pavement and refresh as needed until the final surfacing is placed in accordance with Section 01558: Temporary Pavement Markings, as directed by the Engineer.

I. Completely remove all existing traffic markings that conflict with the Traffic Control Plan, in accordance with Section 02765, article 3.4: "Remove Pavement Markings." Do not use paint or other material to cover markings.

J. **Work done by the Department for installation of RWIS site shall be covered under the Contractors Traffic Control Plan. Coordination must be made with the UDOT ITS Department as to traffic control measures needed and scheduling of activities**.

1.7 TRAFFIC CONTROL MAINTAINER

A. Certified by the Department or by the American Traffic Safety Services Association (ATSSA) as a Traffic Control Technician. Certifications are available through:

Associated General Contractors
1135 South West Temple
Salt Lake City, Utah
Telephone: 801-363-2753

American Traffic Safety Services Association (ATSSA),
15 Riverside Parkway Suite 100
Fredericksburg, Virginia 22406-1022
Telephone: (800) 272-8772
Internet: www.atssa.com

B. Authority:
   1. Obtains and uses all labor, equipment, and materials necessary to maintain traffic control.
   2. Changes traffic control operations per the traffic control plan.

C. Responsibilities and Duties:
   1. Oversees all traffic control operations.
   2. Implements the Traffic Control Plan.
   3. Remains available 24 hours a day, seven days a week and can be on-site within 30 minutes of notification.
   4. Corrects deficiencies immediately upon verbal or written notification from the Engineer or representative.
   5. Inspect and document inspections of traffic control on a form acceptable to the Engineer at least four times each day, at least one of which must be conducted during nighttime hours.
      a. Before beginning of shift.
      b. At mid-shift.
      c. Half-hour after shift ends.
      d. At the midpoint of the off-shift period.
   6. Coordinates project traffic control with emergency services and local law enforcement agencies.
   7. Inspect and document inspections of traffic control twice each day when no construction work is being done.
      a. One during day light hours and one during night time hours
      b. Conduct inspections a minimum of 8 hours apart
   8. Completes a daily record of traffic control activities using a form acceptable to the Engineer.
   9. Submit to the Engineer inspection and activities forms each week on a day and time acceptable to the Engineer.
   10. Provide a daily report of all planned traffic control activities to the Engineer by 7:00 a.m. each day. Provide the report each day during the contract.

1.8 MAINTENANCE OF WORK ZONE TRAFFIC CONTROL

A. Implement and maintain traffic control per the Traffic Control Plan. Implement changes to traffic control required in order to meet UDOT Standard Specifications, Drawings and MUTCD at no additional cost to the Department. Coordinate changes to traffic control and the Traffic Control Plan with the Engineer prior to implementation.

B. Meet all requirements of this Section, article 1.7 when traffic control devices are required to be in place overnight or on weekends.

C. Meet the acceptable classification as identified by *Quality Standards for Work Zone Traffic Control Devices* published by American Traffic Safety Services Association (ATSSA) for traffic control devices.
   1. Wash devices weekly unless conditions warrant more frequent cleaning.

D. Maintain traffic control devices during and after all snow plowing operations at no additional cost to the Department. Clear snow away from all traffic control devices so that the devices function as intended.

1.9 WAGE RATES FOR TRAFFIC CONTROL PERSONNEL (FEDERAL AID JOBS ONLY)

A. Payment of wages must be as stated below during the time the certified Traffic Control Maintainer, or others involved in setting up or maintaining traffic control devices working under the direction of the certified Traffic Control Maintainer, is on the project site and does any of the following work:
   1. Laborer I - for moving traffic control devices by hand; loading or unloading devices on to or off of the truck; and for all hours required to be at the project site except those hours spent in the truck driver classification.
   2. Truck Driver - for all hours spent driving on the project site in the performance of the duties required to maintain the traffic control. The rate of pay is determined by the size of vehicle being driven, Pickup Truck being the smallest.

1.10 PAYMENT PROCEDURES

A. Partial Payments - Based on the percentage of the project completed, excluding the cost of traffic control.

B. Price Adjustments:
   1. The Department reduces payment when traffic control is not in compliance with the Traffic Control Plan, or when the contractor fails to meet all requirements cited or referenced in this specification.
      a. The amount per day by which the Contractor's compensation will be reduced is calculated using the daily charge for Calendar Day in the Schedule of Liquidated Damages in Table 1 of Section 00555 or the Contract lump sum bid price for Traffic Control divided by the number of contract days, whichever is greater.
   2. A Stop Work order issued due to non-compliance with this specification is not considered to be an authorized suspension of contract time. Contract time will continue to accrue as defined Section 00555, article 1.14 “Determining Contract Time.”

C. Include in the bid item "Traffic Control" all materials, equipment, labor, flagging, pilot car, temporary pavement markings and/or removal and workmanship required for the design, implementation and maintenance of the Traffic Control Plan.

D. Provide the Engineer in writing with a detailed analysis showing impacts to traffic control caused by extra work that necessitates modification to the Traffic Control Plan. Negotiate and agree to either a lump sum price for additional Traffic Control or agree to unit prices to be used for additional Traffic Control measures or devices required, prior to performing the extra work.

PART 2 PRODUCTS

2.1 PILOT CAR

A. Equip with a reflectorized sign:
   1. Comply with Section 02891: Traffic Signs
   2. MUTCD sign G20-4

B. Equip with a minimum two rotating lights or strobe lights.
   1. Minimum 4 inch diameter and minimum 6 feet mounting height
   2. Yellow color

2.2 FLAGGER EQUIPMENT AND CLOTHING

A. Comply with to the Department's "Flagger Training Handbook."

B. Comply with Standard Drawings TC Series.

C. Clothing:
   1. Flagger vest and hard hat: Orange, red-orange, or fluorescent version of these colors:
      a. Safety vests with a minimum of 775 inches² of background material. Night work requires a minimum of 201 inches² of reflective material (100 ½ inches² on the front and 100 ½ inches² on the back). Reflective material will be white and/or strong yellow-green.
      b. Hard hat with 10 inches^2 of white or strong yellow-green reflective tape placed around the base of the hard hat and visible to traffic from all directions.

2.3 TRAFFIC CONTROL SIGNING AND DEVICES

A. Signs:
   1. Comply with this Section, article 1.5
   2. Comply with Section 02891, Traffic Signs
   3. Comply with Standard Drawing TC Series
   4. Comply with Standard Drawings SN 7, SN 8, SN 9, and SN 10 when using post mounted signs

B. Channelizing Devices:
   1. Comply with article 1.5
   2. Comply with Standard Drawing TC 1A and TC 1B
      a. Comply with Section 02891, article 2.1, paragraph E "Reflective Sheeting"
      b. Use construction orange tubular markers and cone during daylight hours only.

C. Precast Concrete Barrier:
   1. Comply with article 1.5
   2. Comply with UDOT Standards Drawing TC 2A, Detail AA and Standard Drawing TC 7, Detail TC 7-1
   3. Use an approved construction zone attenuator or permanent style end sections, as listed in UDOT Guidelines for Attenuators and End Section.
      a. Use a construction zone attenuator when approach ends of temporary precast barrier are within AASHTO clear zone.
         - Use AASHTO Roadside Design Guide to determine proper clear zone distance requirements
         - Install crash cushions as per UDOT Standard Drawings CC Series and manufacturer's recommendations.
   4. Do not use a truck mounted attenuator (TMA) to protect temporary precast barrier end for more than 24 hours. Use properly rated TMA as directed in this Section, article 2.3, paragraph D.

D. Use properly rated truck mounted attenuator for the posted speed limit prior to construction.
   1. NCHRP-350 Test Level 2 for speeds 45 mph or less
   2. NCHRP-350 Test Level 3 for speeds greater than 45 mph.

2.4 ADVANCE WARNING ARROW PANEL

A. Advance Warning Device:
   1. Meet all standards as specified in the MUTCD, Section 6F.53 Arrow Panels.

2. Perform all functions as specified in UDOT Standard Drawing TC 1A and the MUTCD

PART 3 EXECUTION

3.1 MODIFICATION OF TRAFFIC CONTROL PLANS

A. Each phase of construction must use an authorized Traffic Control Plan. If a construction phase is proposed that is not covered by the Traffic Control Plan, submit a plan to the Engineer for review.
   1. Submit plans to the Engineer 10 working days before the Traffic Control Plan is to be implemented.
   2. Do not begin work until the Traffic Control plan is authorized for use, and has been fully implemented.
   3. Implement changes required to meet UDOT Standard Specifications, Standard Drawings and MUTCD at no additional cost to the Department.
      a. Comply with this Section, article 1.4, paragraph A, line 1.

3.2 FLAGGING

A. Flaggers must have a current flagging certificate and must present proof of certification upon request by the Department.
   1. Acceptable certifications
      a. UDOT Contractor Certification (Utah Valley State College)
      b. American Traffic Safety Services Association (ATSSA)

3.3 TRAFFIC CONTROL SIGNING AND DEVICES

A. Use posted speed limit prior to construction to compute sign spacing, taper lengths, buffer zones and construction clear zone.
   1. Use plastic drums for lane closure taper devices for speeds 50 mph and greater.
   2. Do not use cones or tubular markers at night

B. Use posted speed during construction to compute the tangent spacing for channelizing devices.

C. Remove all traffic control from site of work when not required within 24 hours.
   1. Remove traffic control devices from the roadway a distance twice that of the Construction Clear Zone, Table 1, Standard Drawing TC 2A, if they will be used within 24 hours of the daily work stoppage and are not required for immediate traffic control.
      a. Obtain written permission from property owner prior to storing traffic control devices on private property.
   2. Cover post mounted signs when directed by Engineer.
      a. Cover signs completely with an opaque and durable covering

3.4 ADVANCE WARNING ARROW PANEL

A. May substitute Type C units for Type B units.
   1. Comply with UDOT Standard Drawing TC 1A

B. Do not substitute Type B units for Type C units.

C. Remove Advance Warning Arrow Panel from the site of work when not needed for the control of traffic within a 4 hour period.

3.5 TRAFFIC SIGNALS

A. Use uniformed police officer when construction activities are impacting an operating signalized intersection.

B. Use of flaggers at traffic signals permitted when the signals have been turned to red flash mode.
   1. Each approach is to be controlled by a separate flagger(s).
      a. Flaggers can control only two lanes of approach traffic
         - Third lane control permitted when left or right turn bays present.

C. Changes to traffic signal operations will be done by the Department.

3.6 CONSTRUCTION ZONE SPEED LIMIT REQUIREMENTS

A. Obtain approval from the Engineer for regulatory speed reductions.
   1. See Standard Drawing TC 2A, General Note 8.
   2. Use speed reduction only when construction activities impact traffic.
   3. Restore regulatory speed limit at locations where construction activities are not impacting traffic.
   4. See Standard Drawings SN 7, SN 8, SN 9, and SN 10 for post mounted sign requirements.

END OF SECTION

May 29, 2003

SPECIAL PROVISION

SP – 0040(51)81

SECTION 01557S

VARIABLE MESSAGE SIGN

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Specifications for furnishing and installation of trailer mounted variable message signs (VMS) to be use in highway traffic control.

1.2 RELATED SECTIONS

A. Section 00555S: Prosecution and Progress.

B. Section 01554S: Traffic Control

1.3 SUBMITTAL

A. Test results for all tests.

1.4 TESTING AND ACCEPTANCE

A. Complete the Field Operations Test.

B. Testing:
   1. Submit Field Operations Testing Plan to Engineer for approval prior to testing. Do not perform any testing until the Engineer has approved the testing plans.
   2. Submit documentation of successful completion of test to the Engineer for approval prior to final acceptance.

C. Notify the Engineer at least two days in advance of the proposed date for the Field Operations Test. The Engineer has the right to witness such tests or to designate an individual or entity to witness such tests.

D. Perform the following Field Operations Test as indicated, following the approved test plan. After all installations are complete in locations coordinated with the Engineer, and the signs are functional, the Contractor will demonstrate to the Engineer all VMS units function in conformance with the requirements as stated in the Specifications. Contact Engineer twenty four hours in advance of testing. Testing is not complete until Engineer is able to verify the following:
   1. Each VMS is adequately powered and meets the qualifications of this specification.
   2. Message legibility is as specified and adequate for anticipated traffic.
   3. Sign self-diagnostic tests perform properly.
   4. Sign message can be displayed properly and blanked.
   5. Sign is set at proper vertical and horizontal angles.
   6. Messages can be set and changed via cell phone.

E. Upon successful completion of such tests, deliver within three days, a written Completion Notice to the Engineer along with a copy of the test results.
   1. Included in the first part of the Completion Notice will be a section specifically documenting any discrepancies.
   2. The Engineer will, within ten days of receipt of the Completion Notice and test results, either accept or reject the Work (specifying, if rejected, the defect of failure in the Work) by delivery of written notice to the Contractor.

F. In the event the Engineer rejects the Work, the Contractor will promptly commence to remedy the defect or failure specified in Engineer's notice.
   1. Thereafter, the Contractor gives the Engineer a Completion Notice.
   2. In the event that the Engineer has not accepted the installation after this second round of tests, the Engineer may authorize others to complete the work at the Contractors expense.

PART 2 PRODUCTS

2.1 VMS

A. Complete Units
   1. Dimensions
      a. Shall be approximately 9 feet high in travel position
      b. Shall be 13 ft. (min.) high in raised position.
      c. Shall be approximately 12 to13.5 ft. long.
      d. Shall be 9 to 10 ft. wide in display position.
   2. Shall be 2800 to 3300 lbs. approximate operating weight.
   3. Shall be designed for 65 mph towing speed in travel position and withstand wind gusts up to 80 mph in display position with all jacks set.
   4. Shall be capable of operating for extended periods (approximately 30 days) at a time without any maintenance.

B. Trailer:
   1. Shall have four each 2,000 pound capacity jacks with crank-type swivels.
   2. Shall be hydraulic surge brakes.
   3. Shall conform to all standard highway specifications.

C. Message Board:
   1. Shall be 72 to 78 inches high x 111 to 130 inches wide x approximately 10 inches deep.
   2. Shall have 3 lines with a minimum of 8 characters each. Each character displayed in each line shall be clearly visible from 1000 feet (min.). At night there is an increase in the 1000-foot legibility. Character size to be a minimum of 12½" wide x 18" high.
   3. Brightness shall automatically adjust according to ambient light conditions during both day and night.
   4. Shall be enclosed in weather tight housing with clear polycarbonate front.
   5. Shall be able to display up to 8 operator-created or pre-programmed messages in sequence.
   6. Shall be capable of being programmed by cellular telephone.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install VMS units in locations as directed by the Engineer.

B. Follow all manufacturer's recommendations and guidelines.

C. Complete testing as specified in Part 1.5.

3.2 OPERATION

A. Regularly inspect each VMS. Repair and maintain VMS as necessary to ensure proper operation.

B. Keep variable messages up to date. Coordinate messages with Engineer.

C. Remove VMS upon completion of project.

END OF SECTION

June 4, 2003

SPECIAL PROVISION

SP – 0040(51)81

SECTION 01559S

TEMPORARY TRAFFIC SIGNAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Traffic Signal

1.2 RELATED SECTIONS

A. Section 01554S: Traffic Control

1.3 REFERENCES

A. AASHTO Roadside Design Guide, Current Edition

B. Manual on Uniform Traffic Control Devices (MUTCD), Current Edition

C. ATSSA: American Traffic Safety Services Association.

PART 2 PRODUCTS

2.1 TEMPORARY TRAFFIC SIGNAL

A. Conform to guidelines set forth in Section 6F.74 of the MUTCD.

B. Contractor is responsible for all aspects of Temporary Traffic Signal operations and maintenance.

May 22, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 02225S

ASPHALT SURFACING REMOVAL (STRUCTURES)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Remove and dispose of existing asphalt surfacing materials from deck and approach slabs.

PART 2 PRODUCTS

2.1 REMOVAL EQUIPMENT

A. Use removal equipment capable of removing a uniform thickness of asphalt on the approach slab without damaging the underlying concrete surfaces.

PART 3 EXECUTION

3.1 PREPARATION

A. Remove any existing waterproofing membrane from the deck and approach slabs.

3.2 ASPHALT SURFACE REMOVAL

A. Remove a uniform thickness of asphalt from the deck and approach slabs without damaging the underlying concrete surfaces.
   1. Field verified the asphalt surfacing removal depth.
   2. Use equipment that weighs less than 22 tons.

END OF SECTION

May 22, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 02741M

HOT MIX ASPHALT

Delete Section 1.1-A and replace with the following:

A. Products and procedures for laying and compacting a surface course of one or more layers of Natural Asphalt Modified HMA comprised of aggregate, asphalt binder, lime and other additives.

Add the following:

C. Do not use recycled asphalt product (RAP) in the Hot Mix Asphalt containing Natural Asphalt.

Delete Section 1.2-E

Delete Section 2.1 and replace with the following:

2.1 NATURAL ASPHALT MATERIAL

A. Use a blend of 75% PG 58-34 as per Section 02745, and 25% natural asphalt as defined by the following:

1. Natural Asphalt: Must be a naturally occurring asphalt from a reliable source that has been field tested and used on previous highway projects for several years and has the following characteristics:

Specific Gravity (ASTM D-70)	**1.3 Minimum**
Penetration (ASTM D-5)	**1 to 4**
Mineral Matter (Reduced to Ash)	**35% to 39%**
Softening Point (RB) (ASTM D-36)	**190°F - 210°F**

B. Meet AASHTO T 40.

C. Refer to UDOT Materials Sampling and Testing Manual.

D. Sampling procedure: UDOT Materials Manual of Instruction Part 8-209.

E. Asphalt Binder Management Plan: UDOT Materials Manual of Instruction Part 8-209 .

Delete Section 2.4-E and replace with the following:

E. Use gyratory mixing and compaction temperatures no greater than 350 °F.

Add the following:

3.8 NATURAL ASPHALT CEMENT CONTROL

A. Agitate the natural asphalt, when melted and blended with the PG asphalt cement, to prevent the settlement of the mineral matter component until applied to the aggregate.

B. Conduct storage, melting, handling and blending of the natural asphalt and PG asphalt cement at the Contractor's Hot Mix Plant location for the project.

C. Perform blending of the PG asphalt cement and the natural asphalt using personnel and equipment with at least two years previous operational bituminous blending experience on highway projects (including the handling and blending of natural asphalt).

D. Make corrections in the job-mix gradation to account for the mineral matter in the natural asphalt.

August 12, 2002

SPECIAL PROVISION

SP-0040(51)81

SECTION 02742S

PROJECT SPECIFIC SURFACING REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Required PG Asphalt or emulsion.

B. Number of gyrations to use for Superpave Mix Design.

PART 2 PRODUCTS

2.1 MIXES

A. Hot Mix Asphalt (HMA): (Refer to bid item for size)

1. PG 58-34 Asphalt.

2. $N_{initial}$ _____ N_{design}_____ N_{final}_____

B. Open-Graded Surface Course:

1. PG _____ Asphalt.

C. Chip Seal

1. Type of asphalt emulsion _____

PART 3 EXECUTION **Not used.**

END OF SECTION

May 1, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 02765S

PAVEMENT MARKING PAINT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish Acrylic Water Based pavement marking paint meeting Federal Specification TTP-1952 D and refer to 2.2 for resin requirement.

B. Apply to hot mix asphalt or Portland cement as edge lines, center lines, broken lines, guide lines, contrast lines, symbols and other related markings.

C. Remove pavement markings.

1.2 REFERENCES

A. AASHTO M 247: Glass Beads Used in Traffic Paint.

B. ASTM D 562: Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using the Stormer-Type Viscometer.

C. ASTM E 1347: Color and Color-Difference Measurement by Tristimulus Colorimetry.

D. ASTM D 2205: Selection of Tests for Traffic Paints.

E. ASTM D 2743: Uniformity of Traffic Paint Vehicle Solids by Spectroscopy and Gas Chromatography.

F. ASTM D 2805: Hiding Power of Paints by Reflectometry.

G. ASTM D 3723: Pigment Content of Water-Emulsion Paints.

H. ASTM D 3960: Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

I. ASTM D 4451: Pigment Content of Paints.

J. ASTM D 5381: X-Ray Fluorescence (XRF) Spectroscopy of Pigments and Extenders.

K. Federal Standards 595B, 37875, 33538,11105 and TTP-1952 D.

1.3 ACCEPTANCE

A. Provide fixtures (ball valves, gate valves or other) on paint truck for the purposes of obtaining field samples.

B. Agitate the paint to allow for thorough mixing. Follow paint manufacturer's recommendation for agitation and mixing times.

C. Stop all agitation before sample is drawn.

D. All meters on the paint truck must be calibrated annually and certified for application rate verification. Calibration tolerances for meters must be +/- 0.5 pounds per gallon. Keep a clean, legible copy of calibration report with the paint truck. Certifications performed by company personnel, meter calibration companies or UDOT Equipment Certification Unit.

E. UDOT ENGINEER:
1. Visually inspects each line to verify bead adhesion and compliance with specified line dimensions requirements.
2. Verifies that the paint and beads are being applied within specified tolerances a minimum of once each production day.
3. Verifies quantities used by either method:
    a. Measuring both paint and bead tanks prior to and after application.
    b. Witnessing the meter readings prior to and after application.
4. Randomly sample each color of pavement marking paint used, minimum of one sample each per project.
    a. Use a clean one pint metal paint can.
    b. Sample paint immediately after the paint has been completely agitated. (Stop all agitation before drawing the sample)
    c. Allow a minimum of 10 gallons to be applied prior to taking sample.
    d. Fill the sample container to within ½ inch of full.
    e. Seal the containers immediately by tightly attaching the container's lid.
    f. Submit paint samples to Central Chemistry Lab for acceptance.

g. For each sample include:
- Project Number
- Project Name
- Paint Manufacturer
- Batch Number
- Striping Company
- Color of Paint
- Est. Quantity
- Date Sampled
- Sampler's name

F. Repaint any line or symbol failing to meet bead adherence and dimensional requirements.

G. Price Reductions for Pavement Markings installed below the specified wet mil thickness are outlined in Table I.

H. Contractor will repaint pavement markings that fail to meet the quantitative requirements of Article 2.2 Paint, at no cost to the Department.

Table I - Price Reduction for Wet Mil Thickness	
	Pay Factor
At the specified mil thickness	1.00
1-10 percent below the Specified wet mil thickness	0.75
11-15 percent below the Specified wet mil thickness	0.50
More than15 percent below the Specified wet mil thickness	Replace Pavement Markings

PART 2 PRODUCTS

2.1 Manufacturers

A. Select an acrylic water based pavement marking paint manufacturer from the Accepted Products Listing (APL) maintained by the UDOT Research Division.

2.2 Paint

A. Follow Federal Standards 595B, 37875, 33538, and 11105. Meet the following quantitative requirements for Acrylic Water Based Paint listed in Table II:

Table II - Quantitative Requirements

Property	White	Yellow (lead free)	Black	Test
Pigment: Percent by weight	62.0 +/- 2	62.0 +/- 2	62.0 +/- 2	ASTM D 3723
Total Solids: Percent by weight, minimum	77.0	77.0	77.0	ASTM D 2205
Nonvolatile vehicle: Percent by weight vehicle, minimum*	40.0	40.0	40.0	ASTM D 2205
Viscosity, KU @ 77 degrees F	80 - 95	80 - 95	80 - 95	ASTM D 562
Volatile Organic Content(VOC): lbs/gal, maximum	1.25	1.25	1.25	ASTM D 3960
Directional Reflectance: Minimum	92.0	50.0	N/A	ASTM E 1347
Dry Opacity: Minimum (5 mils wet)	0.95	0.95	N/A	ASTM D 2805

* The binder shall be 100 percent acrylic, a minimum of 40 percent, by weight, as determined by infrared analysis and other chemical analysis available to UDOT (ASTM D 2205). Consisting of either Rohm and Haas Fastrack HD- 21A or Dow DT-400NA.

B. Additional requirements:
1. Free of lead, chromium, or other related heavy metals ASTM D 5381.
2. ASTM D 2743, ASTM D 4451 and ASTM D 5381: Tests used to verify paint samples meet “Accepted Products Listing.”

2.3 GLASS SPHERE (BEADS) USED IN PAVEMENT MARKING PAINT

A. Specific Properties: Meet AASHTO M 247.
   1. Gradation:

Passing a No. 14 sieve, percent	95 - 100
Passing a No. 16 sieve, percent	80 - 95
Passing a No. 18 sieve, percent	10 - 40
Passing a No. 20 sieve, percent	0 - 5
Passing a No. 25 sieve, percent	0 - 2

   2. Beads having a Silane adhesion coating.
   3. Roundness - The glass beads will have a minimum of 80 percent true spheres.

B. Beads used in Temporary Pavement Markings meet AASHTO M247 Type II uniform gradation.

PART 3 EXECUTION

3.1 PREPARATION

A. Line Control.
   1. Establish control points at 100 ft intervals on tangent and at 50 ft intervals on curves.
   2. Maintain the line within 2 inches of the established control points and mark the roadway between control points as needed.
      a. Remove paint that is not placed within tolerance of the established control points and replace at no expense to the Department. Refer to article 3.4.
      b. Maintain the line dimension within 10 percent of the width and length dimensions defined in Standard Drawings ST1 - ST8.

B. Remove dirt, loose aggregate and other foreign material and follow manufacturer's recommendations for surface preparation.

3.2 APPLICATION

A. Apply Pavement marking paint at the following Wet mil thickness requirements.
1. 20 – 25 wet mils for all markings.

Example Calculation: (Verify wet mil thickness)

$$\text{Wet Mils} = \frac{(0.133681\ ft^3/gal)}{(X\ ft/gal)(Z\ ft)} * 12000\ mil/ft$$

Where,
X = application rate. (Meter readings or dipping tanks).
Z = line width measured in feet.
12000 = conversion from ft to mil
0.133681 = conversion from gallons to cubic feet.

For information only: Approximate application rate for required mil thickness requirements.
1. 4 inch Solid Line: From 190 to 240 ft/gal
2. 4 inch Broken Line: From 760 to 960 ft/gal
3. 8 inch Solid Line: From 95 to 120 ft/gal

B. Refer to Table I for pavement markings that are less than 20 wet mils in thickness.

C. No additional payment for pavement markings placed in excess of 25 wet mils in thickness or exceeding dimensional requirements outlined in Article 3.1 paragraph A.

D. Painted Legends and Symbols 1 gallon per 80 square feet. Provide Engineer calculations of legends and symbols for pay determination.

E. Glass Sphere (Beads): Apply a minimum of 8 lbs/gal of paint, the full length and width of line and pavement markings.
1. Do not apply glass beads to contrast lines (black paint).

F. Begin striping operations no later than 24 hours after ordered by the Engineer.

G. At time of application apply lines and pavement markings only when the air and pavement temperature are:
1. 50 degrees F and rising for Acrylic Water Based Paint.

H. Comply with Traffic Control Drawing TC-16

3.3 CONTRACTOR QUALITY CONTROL

A. Application Rate: Verify that the paint and beads are being applied within specified tolerances prior to striping.

B. Curing: Protect the markings until dry or cured. In the event that the uncured marking is damaged the marking will be reapplied and track marks left on the pavement will be removed at no additional cost to the Department.

3.4 REMOVE PAVEMENT MARKINGS

A. Use one of these removal methods:
   1. Grinding
   2. High pressure water spray
   3. Sand blasting
   4. Shot blasting.

B. Do not eliminate or obscure existing striping, in lieu of removal, by covering with black paint or any other covering material.

C. Use equipment specifically designed for removal of pavement marking material.

END OF SECTION

May 22, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 03371S

EPOXY-URETHANE POLYMER CRACK TREATMENT AND WATERPROOFING OVERLAYS FOR BRIDGE DECKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for applying a protective crack treatment and bridge deck overlay using epoxy-urethane polymers and a broadcast aggregate wearing surface.

1.2 REFERENCES

A. ASTM C-638: Tensile Stress and Load Bearing Capacity

B. ASTM C-566: Aggregate Testing

C. Mohs Scale Hardness Test

D. Sieve Analysis: Aggregate Gradation

E. ASTM C-109: Compressive Strength of Hydraulic Cement Mortars

F. ASTM C0778: Sampling

G. ASTM D-570: Water Absorption of Plastics

H. ASTM D-2240: Rubber Property – Durometer Hardness

I. ASTM C-501: Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abrader

J. ACI – 503R: Adhesion to Concrete, Pull Out Test

K. California Test Method 419: Flexural Creep

L. ASTM D-790: Flexural Yield Strength

M. ASTM D-971: Surface Tension

N. NCHRP 244: Chloride Penetration Test Method

O. ASTM 4065-95: Dynamic Mechanical Analysis

1.3 SUBMITTALS

A. Submit, the name of the manufacturer of the Polymer Overlay materials at the Pre-Construction Meeting.

B. Submit at the Preconstruction Meeting, a Certificate of Compliance from an independent nationally recognized laboratory stating that the polymer overlay materials meet the requirements listed in Tables 1, 2, 3, 4, 5 and other material requirements contained in this specification.

C. Submit a name and phone number of the Manufacturer's Technical Support Representative at the Preconstruction Meeting.

PART 2 PRODUCTS

2.1 EPOXY-URETHANE BRIDGE DECK OVERLAY SYSTEM

A. Install an **epoxy-urethane bridge deck overlay system** consisting of surface preparation, application of a pretreatment for crack filling and bonding, and two (2) coats of an epoxy-urethane polymer resin broadcast with a high wear, high skid aggregate that chemically cures to provide an impervious wearing surface.

2.2 STEEL SHOT BLAST

A. Clean concrete surfaces using a Steel Shot Blast in accordance with the recommendations of the polymer overlay manufacturer.

2.3 PRETREATMENT AND CRACK FILLER

A. After cleaning the concrete surface, apply a two (2) component pretreatment to the bridge deck to fill minor cracks and increase the bond strength between the overlay and the deck surface. Pretreatment to comply with the physical properties of TABLE 1:

TABLE 1 PHYSICAL PROPERTIES OF THE PRETREATMENT SYSTEM	
Property	Value
Compressive Strength, min. psi	5,500 – 6,000
Tensile Strength, min. psi	3,100 – 3,400
Tensile Elongation, percent min.	35 ±5
Water Absorption, percent by wt. Max.	<0.10
Shore D Hardness, 77°F min.	70 ±5
Gel Time, minutes	48-52 (7 oz.)
Adhesion to Concrete	100% failure in concrete
Surface tension	*Less than 0.0012 pounds/in^3*
Percent Solids	100

2.4 EPOXY-URETHANE POLYMER OVERLAY

A. After applying the pretreatment, apply two (2) layers of a two-part epoxy-urethane co-polymer resin and saturate it with a broadcast aggregate before it cures. The polymer overlay is to be free of any fillers and volatile solvents. The use of external/conventional flexiblizers is not permitted. They polymer is to be formulated to volumetric mixing proportions (such as 1 part A to 1 part B), according to the manufacturer's recommendations. The cured polymer system is to comply with the physical requirements of TABLE 2.

TABLE 2 PHYSICAL PROPERTIES OF THE EPOXY-URETHANE OVERLAY SYSTEM	
Property	Value
Compressive Strength, min. psi	7,000
Tensile Strength, min. psi	2,500
Tensile Elongation, percent min.	35 ±5
Water Absorption, percent by wt. Max.	0.20
Shore D Hardness, 77°F min.	65 ±5
Gel Time, minutes	22-31
Abrasion Resistance, oz., max.	0.003
Adhesion to Concrete	100% failure in concrete
Flexural Creep: Total Movement in 7 days	*.0065 in*
Flexural Yield Strength, min. psi	5,000
Percent Solids	100

B. The modulus of the cured epoxy-urethane system is to comply with the requirements of TABLE 3, using a variable temperature Dynamic Mechanical Analysis (DMA) at a frequency of 1 HZ with a 0.3% strain using ASTM D-4065-95.

C. The cured epoxy-urethane system is to conform to a load bearing capacity retaining 85% of its original load bearing strength at (tensile strength) as 20% strain using ASTM method D-638.

TABLE 3
VISCO-ELASTIC PROPERTIES OF THE EPOXY-URETHANE SYSTEM

TEMPERATURE	STORAGE MODULUS pounds/in^2	LOSS MODULUS Pounds/in^2
14°F	$1.45X10^5$	$8.70X10^3$
68°F	$1.01X10^5$	$1.30X10^4$
122°F	$5.80X10^3$	$4.35X10^3$
140°F	$1.45X10^3$	$1.01X10^3$
158°F	$8.70X10^2$	$2.90X10^2$

2.5 AGGREGATE

A. An aggregate wearing surface is to be broadcast into the epoxy-urethane system according to the manufacturer's specifications. The aggregate used is to be non-friable, non-polishing, and clean and free of surface moisture. It should have a proven record of durability in this type of application. 100% of the aggregate is to have at least 1 mechanically fractured face for materials being retained on the #10 sieve. The aggregate is to be thoroughly washed and kiln dried to a maximum moisture content of 0.2% by weight (ASTM C-566). The recommended aggregate is Washington Stone. Alternate aggregates may be allowed upon approval by the manufacturer and ENGINEER.

B. The aggregate is to meet the physical properties of TABLE 4 and TABLE 5:

TABLE 4 AGGREGATE PROPERTIES	
GLACIAL GRAVEL	BASALT QUARTZITE GRANITE (% by Weight)
$Si0_2$	75.03
Al_2O_3	11.49
Fe_2O_3	3.57
CaO	2.84
MgO	1.59
SO_3	0.08
Na_2O	2.58
K_2O	0.99
Combined Alkali	3.20
Ignition Loss	1.72
Mohs Scale Hardness	6.50
ASTM 566 (water absorption)	0.2%

TABLE 5 AGGREGATE GRADATION	
Sieve Size (#4 x #10)	Percent Passing
0.187 in	100
0.078 in	10 – 35
0.033 in	0 – 10

PART 3 EXECUTION

3.1 SURFACE PREPARATION

A. Pot-Hole Patching: Repair any minor potholes of the surface area of the deck with a similar epoxy-urethane material in accordance with the recommendations of the manufacturer and the ENGINEER. Any costs associated with the pothole repairs are included in the Bid Item for the Polymer Overlay System.

B. Shot-Blasting: The entire deck is to be cleaned by steel shot-blasting to remove any oil, dirt, rubber or other materials that, in the opinion of the manufacturer or ENGINEER, may be detrimental to the bonding and curing of the polymer overlay.

C. Curbs: In areas that cannot be reached with the steel shot-blasting, such as curbs, sandblasting equipment or mechanical grinders are permitted with the approval of the manufacturer or ENGINEER.

D. Traffic: Traffic is not to be allowed on any portion of the deck which has been shot-blasted. The overlay equipment will be allowed on cleaned surfaces under the supervision of the manufacturer.

E. Weather: All surfaces to be treated are to be dry at the time of application. The polymer overlay system is not to be applied when it has rained within 24 hours or is expected to rain within 8 hours. Moisture content in the concrete substrate is not to exceed 4.5% when measured by an electronic meter. The minimum recommended temperature is 50°F and increasing. The polymer overlays are not to be applied before April 15th or after September 30th.

3.2 APPLICATION

A. Sound Surface: The application of the pretreatment and Epoxy-Urethane Overlay Systems are to be on a structurally sound concrete surface and in accordance with the manufacturer's specifications.

B. Metered Mixing Equipment: The overlay shall be applied on all deck areas using metering, mixing and distribution machinery *owned and operated* by the manufacturer. The application machine shall feature positive displacement volumetric metering pumps controlled by a hydraulic power unit. Components shall be stored in temperature controlled reservoirs capable of maintaining 100° (±10°)F to insure optimum mixing. Ratio check verification at the pump outlets as well as cycle counting capabilities to monitor output will be standard features. Line mixing shall be motionless so as to not overly shear the material or entrap air in the mix. The machine shall maximize working time of the material by mixing it immediately prior to dispensing.

C. Layer Thickness: The number of layers and the application rates of the liquid in the various layers shall be as recommended by the manufacturer in order to achieve a minimum overlay thickness of 0.375 in.

D. First Layer: Application of the Liquid: After manually or mechanically measuring and mixing of the components, the liquid shall be evenly distributed on the clean, dry deck surface at the rate as recommended by the manufacturer. After the entire deck surface is wet, allow 1-2 hours for the liquid to achieve full depth penetration into cracks as well as adequately encapsulate the steel grid, if any. After the liquid is allowed to penetrate, medium size coarse silica sand may be broadcast evenly if the subsequent application is going to be applied after 8-12 hours.

E. Second Layer: Prior to the application, if there exists any excess or loose aggregate from the previous coat, such excess aggregate shall be completely removed by vacuum or with compressed air. After mixing of the components via the mechanical application equipment, the liquid shall be evenly distributed on the clean, dry deck surface at the rate as recommended by the manufacturer.

F. Time Limits For Aggregate: After the application of the liquid in the first and second coats, the maximum time allowed before broadcasting of the aggregate is as follows:

Above 90°F	10 minutes
80°F to 90°F	15 minutes
70°F to 80°F	20 minutes
60°F to 70°F	25 minutes
50°F to 60°F	35 minutes

G. Broadcasting Aggregate: Broadcasting on decks shall be by truck-mounted equipment capable of dispensing the aggregate onto the deck in a uniform manner as directed or otherwise approved by the manufacturer. The aggregate shall be broadcast such that to cover the surface so that no wet spots appear and before the co-polymer begins to gel. The aggregate must be dropped vertically in such a manner that the level of the liquid is not disturbed. In the first and second layers of the liquid, aggregate conforming to TABLES 4 and 5 of this specification shall be broadcast to saturate until no wet spots remain.

H. Removal of Excess Aggregate: After the overlay has hardened, removal of all loose and excess aggregate with a power vacuum or other method shall be made prior to the application of subsequent coats.

I. Longitudinal Joints in The Overlay: (i.e., between two adjacent lanes) shall be staggered and overlapped between successive coats so that no ridges will appear.

J. Traffic: Traffic may be allowed on the final layer, on in between layers after the resin has cured (as determined by the manufacturer) and after removal of all excess, loose aggregate.

K. Storage And Handling, Liquid Material: All material shall be transported and stored in their original containers inside a dry, temperature controlled facility and maintained at a minimum temperature of 60°F to 90°F.

L. Job Site Storage: The materials shall be stored on the job site in a dry, weather protected facility away from moisture and within the temperature range of 60°F to 90°F. When the materials are transported or stored on the job or in the application machine tanks, the material must also be maintained at a temperature of 60°F to 90°F.

M. Handling of Liquid Materials on The Job: Protective gloves, clothing, boots and goggles shall be provided to workers and inspectors directly exposed to the material. Product safety data sheets shall be provided to all workers and inspectors as obtained from the manufacturer.

N. Aggregate: All aggregate shall be stored in a dry, moisture-free atmosphere. The aggregate shall be full protected from any contaminants on the job site and shall be stored so as not be exposed to rain or other moisture sources.

3.3 QUALITY CONTROL

A. Technical Support Representative: The manufacturer shall have a representative on the job site at all times who, upon consultation with the ENGINEER, may suspend any item of work that is suspect and does not meet the requirements of this specification. Resumption of work will occur only after the manufacturer's representative and the ENGINEER are satisfied that appropriate remedial action has been taken by the CONTRACTOR.

B. Warranty: The epoxy-urethane co-polymer manufacturer and the CONTRACTOR shall jointly guarantee the wearing surface against all defects incurred during normal traffic for a **period of three (3) years**, for any delamination or reduced skid (less than 50). The guarantee period shall commence on the date of acceptance of work (typically the date traffic is allowed on surface),

C. Samples: The manufacturer shall furnish at least one-liter sample of each component from each lot to the DOT laboratory to verify material supplied.

D. Prior Performance: The selected material must have a satisfactory performance in Utah for at least 2-years from the time of placement.

E. Packing Requirement: All materials must be packed in strong, substantial containers. The containers shall be identified as Part A and Part B and shall be plainly marked with the name and address of the manufacturer, name of the product, mixing proportions and instructions, lot and batch numbers, date of manufacture and quantity contained therein.

F. Material Quality Control And Testing Methods: The materials used shall meet the properties specified in the tables and other sections of this specification, and shall also meet the following correspondence tests for quality control:

1. Compressive Strength: ASTM C-109, *Compressive Strength of Hydraulic Cement Mortars.* The two components of the resin are to be thoroughly mixed in their appropriate ratios. Two volumes of graded silica sand, in accordance with ASTM C-778, shall be added to one volume of mixed resin. The samples shall then be prepared according to the requirements of ASTM C-109 and allowed to cure for 7 days at 73° (±4°)F.
2. Tensile Strength and Elongation: ASTM D-638, *Tensile Properties of Plastics*, Specimen Type I or Type II. Samples shall be cured at 73° (±4°)F and 50 (±5)% relative humidity. Speed of testing shall be 0.5 in/min.

3. Water Absorption: ASTM D-570, *Water Absorption of Plastics*. Sample specimens shall be prepared according to Section 4.1 and allowed to cure at 73° (±4°)F and 50 (±5)% relative humidity. Tests are then to be carried out as per Section 6.1.

4. Shore D Hardness: ASTM D-2240, *Rubber Property – Durometer Hardness*. Specimen shall be prepared as per ASTM D-570 Section 4.1 and allowed to cure at 73 (±4°)F.
5. Gel Time: The following procedure shall be used to determine gel time:
   a. Measure 4 oz of Part A and 2 oz of Part B, each at 77°F, into an unwaxed paper cup and record the time and mix immediately. 3.5 oz of this mixture shall be poured into a 6 oz unwaxed paper cup and placed on a wooden bench top. Starting twenty (20) minutes from the time recorded above, the mixture shall be probed every two (2) minutes with a small stick until a small ball forms in the center of the container. The total time, including mixing, required for the ball to form shall be regarded as the gel time. The test shall be performed in a room or enclosed area maintained at 77° (±4°)F and 50 (±5)% relative humidity.
6. Abrasion Resistance: ASTM C-501, *Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abrader*. Tests shall be done using a CS-17 wheel and a 2.2 pound load for 1,000 cycles.
7. Adhesion to Concrete: ACI-503-R, Pull Out Test.
8. Flexural Creep: California Test Method 419.
9. Flexural Yield Strength: ASTM D-790.
10. Surface Tension: ASTM D-971.

END OF SECTION

May 22, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 03381S

CLEAR PENETRATING CONCRETE SEALER FOR BRIDGES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for applying protective penetrating concrete sealers (**vinyl toluene acrylic silane polymer**) on traffic face and top face of bridge parapet walls.

1.2 REFERENCES

A. ASSHTO T 260: Sampling and Testing for Total Chloride Ion in Concrete and Concrete Raw materials.

B. ASTM C 267: Chemical Resistance of Mortars, Grouts, Monolithic Surfacings and Polymer Concretes.

C. ASTM C 666: Resistance of Concrete to Rapid Freezing and Thawing.

D. ASTM E 274: Skid Resistance of Paved Surfaces Using a Full-Scale Tire.

1.3 SUBMITTALS

A. Certificate of Compliance to the ENGINEER or the Construction and Materials Division.

B. One liter of the product to the ENGINEER for each lot of material.

C. Material Safety Data Sheets (MSDS).

D. Each container shall be clearly marked with lot numbers, date of manufacture, pertinent safety and handling information and emergency contact phone numbers.

PART 2 PRODUCTS

2.1 PENETRATING CONCRETE SEALERS

A. Vinyl toluene acrylic silane polymer blend penetrating sealant for concrete surfaces. Substitution of the alktrialkoxy film forming silane by silicones or siloxanes will not be permitted.

B. Slight color dies are allowed for application purposes, with clear appearance within 7 days of application.

C. Comply with Federal VOC requirements.

D. Comply with requirements of TABLE 1.

TABLE 1
PENETRATING CONCRETE SEALER REQUIREMENTS

***Properties**	*Requirements*	*ASTM*	*AASHTO*	****UDOT**
Accelerated Weathering	As Specified	C 666	T 260	
Freeze-Thaw Test Medium	≤3% Road Salt			Sealer Studies
Minimum Depth Penetration	≥5/32 in.			Sealer Studies
Freeze-Thaw Weight Loss	≤6% 300 Cycles			Sealer Studies
Chemical Resistance	Subsections: 1.1.2 1/1/3	C 267		
Friction Number	≥40	E 274		
Infrared Spectrogram	Materials Division Base Comparison			Materials Studies

* Certified test results from a private accredited testing laboratory will suffice for acceptance.
** Utah Department of Transportation, Materials and Research Division concrete sealer studies of 1986 and 1990.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean concrete surfaces of latence, dirt, dust, grease, oil and other contaminants using a low-pressure hydro-wash, according to the manufacturer's recommendations, without causing undue damage to the concrete surfaces or exposing the course aggregate of the concrete.

B. Allow cleaned surfaces to sufficiently dry after cleaning process before applying sealant (2 hours minimum, or longer according to the manufacturer's recommendations, whichever is greater). Apply sealants no later than 3 calendar days after cleaning the concrete surfaces.

C. Supplier of the sealant product must have a technical support person available at the job site within 24 hours of notification for quality control purposes.

D. Place the sealant material only after obtaining the approval from the ENGINEER.

3.2 APPLICATION

A. Application Rate:
   1. Based upon the residue content at a coverage rate of 0.012 pounds/ft^2.
   2. Apply according to manufacturer's recommendation for each of the following surfaces: Horizontal, Vertical, Overhead.

B. The sealant solution shall not be diluted in any way.

C. Use low-pressure airless sprayers or horticulture type spray bars to allow proper application of material.

D. Application Drying Time: Select a sealer with maximum drying time of 1½ hours, and the ability to allow traffic on the treated surfaces within 4 hours of application without tracking or damage to vehicles.

E. Apply sealant only when ambient air and concrete temperatures are above 50 degrees F.

F. Prevent sealant from blowing or tracking onto vehicles. Sealant shall not be applied when blowing winds, inclement weather or other conditions prevent proper application.

END OF SECTION

May 22, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 03921S

PARAPET SURFACE REPAIR

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Repair existing concrete front face and top of parapets.

1.2 RELATED SECTIONS

A. Section 03310: Structural Concrete.

B. Special Provision 03381S: Clear Penetrating Concrete Sealer For Bridges.

PART 2 PRODUCTS

2.1 MATERIALS

A. Patching Concrete:
   1. Approved patching concrete product from the Accepted Products Listing, available at www.dot.utah.gov/res.
   2. Use only products for which vertical application is recommended by the manufacturer.

B. Substrate Coating: Bonding agent or primer recommended by the patching concrete manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

A. For Surface Repair:
   1. Remove loose and spalled concrete before sandblasting.
   2. Sandblast the top and traffic face of the concrete surfaces to remove all dirt, grease, laitance, rust and corrosion prior to placing concrete.

B. For Sealing:
   1. Sandblast the top and traffic face of the parapet surfaces to remove all dirt, grease and laitance.
   2. Patch spalled or damaged spots on parapets before applying sealer.

3.2 SURFACE REPAIR

A. Prevent sandblasting material and debris from falling into streams, pedestrian areas, traffic areas, or onto railroad tracks.

B. After sandblasting, coat concrete substrate with the manufacturer's recommended primer of the particular patching concrete.

C. Place concrete within the manufacturer's prescribed time period after sandblasting and prime coating has been completed.

D. Patching Concrete:
   1. Apply the one component, non-shrinking patching concrete uniformly to build back the original surfaces of the face and top areas of the parapets to within ± 1/8 inch of the original surface. Allow concrete to cure in accordance with the requirements of the manufacturer's recommendation.
   2. If the patch fails to bond to the existing concrete, remove the patch completely and repair again.

E. Finishing Surfaces:
   1. Provide a uniform color matching existing parapet.
   2. Finish according to Section 03310, Part 3, article, “Concrete Surface Finishing.” Follow manufacturer's recommendations for procedure.

F. If wingwalls, overhanging portions of the deck, and/or exterior beam surfaces become stained or discolored due to water or concrete leaking from the forms, provide a satisfactory treatment to restore these surfaces to a uniform color.

G. Remove sandblasting materials and debris from the deck after the work is complete.

3.3 SEALING

A. Apply protective penetrating concrete sealers (**vinyl toluene acrylic silane polymer**) on traffic face and top face of bridge parapet walls according to Special Provision 03381S, "Clear Penetrating Concrete Sealer for Bridges."

END OF SECTION

June 6, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 03934S

STRUCTURE POTHOLE PATCHING, QUICK SET

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for preparing and installing quick setting concrete patch materials for horizontal surfaces only.

1.2 REFERENCES

A. ASTM C 267: Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer concretes.

B. ASTM C 666(modified): Resistance of Concrete to Rapid Freezing and Thawing.

C. ASTM E 274: Skid Resistance of Paved Surfaces Using a Full-Scale Tire.

D. Utah Department of Transportation's Material Test for Bond and Durability.

E. ASTM C 109: 2" x 2" x 2" Cubes.

1.3 SUBMITTALS

A. Certificate of Compliance to the Engineer.

PART 2 PRODUCTS

2.1 GENERAL

A. The material is packaged and ready for mixing just prior to use in accordance with the manufacturer’s instructions.

1. Concrete gray in color and contains no calcium chloride or admixture containing calcium chloride, or other ingredient in sufficient quantity to cause corrosion to steel reinforcement.

2. Quick-setting rapid strength gain, non-shrink and high bond strength characteristics are needed.

2.2 FAST SETTING CEMENTITIOUS CONCRETE REPAIR MATERIALS

A. For potholes less than 4 inches in depth, the use of quick-setting materials will be allowed with the prior approval of the Engineer or manufacturer, including quick-setting cementitious concrete, epoxies and urethane material at least 7 days prior to use.

B. Approved patching concrete products from the Performance Data Product Listing (PDPL), available at www.dot.gov/res - J.1. PCC Repair Mtls- Horizontal.

C. REQUIREMENTS

Fast Setting Concrete Repair Materials

*Properties	Requirements	ASTM	AASHTO	**UDOT
Accelerated Weathering	As Specified	C 666(Modified)	T 260	
Accepted Bond Strengths	>1,000 psi @ 24 Hours			UDOT Slant/Shear Bond Test
Test Medium	<3% White Utah Road Salt			UDOT Freeze/Thaw Weight Loss
Accepted Weight Loss	<15% @ 300 Cycles			UDOT Freeze/Thaw Weight Loss
Friction Number	>40	E 274		

* Certified test results from a private AASHTO accredited testing laboratory will suffice for acceptance.

** Utah Department of Transportation, Research Division, fast setting concrete repair materials studies from 1991 through 1995.

PART 3 EXECUTION

3.1 PREPARATION

A. Traditional Method: Saw Cut & Jackhammer 1" deep.

B. Hydro-Blasting with a 30,000 psi minimum pressure.

C. Keep bonding surfaces free from laitence, dirt, dust, paint, grease, oil, rust or any other contaminant other than water.

3.2 INSTALLATION

A. Pre-test the materials under field conditions, at the patch depth anticipated, to determine whether subsequent cracking will occur. The corrective action will be at the discretion of the Engineer.

B. Saturate Surface Dry (SSD) all surfaces receiving fast setting concrete repair materials in accordance with manufacturer's recommendation.

C. Scrub a small amount of fast setting concrete repair material to the walls and bottom of the prepared surface. Apply product, consolidate, strike off and finish repair area. Follow manufacturer's recommendations for product preparation and installation. Repairs shall be within 1/16th inch plus or minus the surrounding pavement.

D. Fast setting concrete repair material must meet a minimum compressive strength of 3,000 psi in 4 hours according to test cylinders taken. One cylinder per batch for the first two days to determine consistency of product, then random cylinders there after.

E. Cure fast setting concrete repair material per manufacturer's recommendation. If the Contractor is adding more than 15 pounds of size No. 8 coarse aggregate per bag of quick setting patch material, the mix design must be in accordance with the requirements of Section 03055.

END OF SECTION

May 22, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 05831S

JOINT GLAND REPLACEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Remove existing expansion joint gland from bridge deck and install new joint gland at Abutment #4, Structure No. C-753.

1.2 RELATED SECTIONS

A. Section 03055: Portland Cement Concrete.

B. Section 03211: Reinforcing Steel and Welded Wire.

C. Section 03310: Structural Concrete.

D. Section 05120: Structural Steel.

E. Section 03934S: Structure Pothole Patching, Quick Set

1.3 REFERENCES

A. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

B. AASHTO M 235: Epoxy Resin Adhesives.

C. AASHTO M 270: Structural Steel for Bridges.

D. AISC: American Institute of Steel Construction.

E. ASTM C 578: Rigid, Cellular Polystyrene Thermal Insulation.

F. ASTM D 395: Rubber Property-Compression Set.

G. ASTM D 412: Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

H. ASTM D 471: Rubber Property-Effect of Liquids.

I. ASTM D 573: Rubber-Deterioration in an Air Oven.

J. ASTM D 1149: Rubber Deterioration-Surface Ozone Cracking in a Chamber.

K. ASTM D 2240: Rubber Property-Durometer Hardness.

L. Federal Specification TT-S-00230:

PART 2 PRODUCTS

2.1 MATERIALS

A. Portland Cement Concrete: Class AA(AE). Refer to Section 03055.

B. Cement: Refer to Section 03055.

C. Lubricating Material: Follow Federal Specification TTS-00230.

D. Epoxy Resin Adhesive: Follow AASHTO M 235.
   1. Type II.
   2. Choose class rating consistent with the application temperature.

E. Reinforcing Steel (Coated): Refer to Section 03211.

F. Rigid Plastic Foam: Type 9, density of 2 lbs/ft^3. ASTM C 578.

G. Neoprene Gland: Single convolution type with the following physical properties:

Table 1

Property Method	Requirements	ASTM
Tensile Strength, min. psi	2,000	D 412
Elongation at break, min. percent	250	D 412
Hardness, Type A Durometer (modified)	55 ± 5	D 2240
Compression Set, 70 hr. at 212 degrees F. Method B (modified)	40 percent	D 395
Oven Aging, 70 hr. at 212 degrees F. Tensile Strength. Loss, max. Elongation, loss, max.	 20 percent 20 percent	D 573
Hardness, Type A Durometer (points change)	0 to + 10	
Oil Swell, ASTM Oil 3, 70 hr at 212 degrees F. Weight Change, max	45 percent	D 471
Ozone Resistance, 20 percent Strain, 300 pphm in air 70 hr. at 104 degrees F. (modified)	No cracks	D 1149

2.2 JOINT SYSTEM

A. Use 5" rated capacity continuous expansion joint gland.

2.3 JOINT GLAND

A. Field verify the existing steel extrusion system. Use the correct joint gland type and size from only one brand of the following systems:
   1. Wabo Strip Seal System
   2. Structural Accessories Strip Seal System
   3. D. S. Brown Strip Seal System

PART 3 EXECUTION

3.1 CONCRETE REMOVAL

A. Repair spalling and damaged concrete, retaining existing reinforcing steel in place.
All repairs shall be made as directed by the Engineer.

B. Use jackhammer method to remove existing concrete.
1. Partial Depth Removal: Use 30-pound class hand operated jackhammers or smaller.
2. Full Depth Removal: Use 90-pound class hand operated jackhammers or smaller.
3. Operate jackhammers at an angle greater than 45 degrees as measured from the deck surface.

C. Prevent debris from falling into pedestrian areas, traffic areas and on railroad tracks.

3.2 REINFORCING STEEL

A. Existing Reinforcing Steel: Clean steel that remains in place thoroughly of all corrosion and adhering materials by sandblasting.

B. New Reinforcing Steel: Place coated reinforcing steel after sandblasting operations are complete.

3.3 SYSTEM INSTALLATION

A. Install expansion joint system according to the manufacturer's recommendations.

B. A factory-trained representative must be present during setting of the system, installation of neoprene seal element, and during the watertight integrity test.

3.4 JOINT WIDTH

A. Form the joint width, as shown on the plans, using rigid plastic foam. Anchor securely.

B. Place rigid plastic foam between sections of concrete parapet to maintain separation of sections.

3.5 PLACE CONCRETE

A. Clean concrete and steel surfaces before coating with an epoxy adhesive. Follow adhesive manufacturer's application instructions.

B. Place concrete according to Sections 03055 and 03310.

3.6 INSTALL JOINT GLAND

A. Install the new gland according to the manufacturer's installation procedure.

B. The neoprene seals shall be in continuous lengths spanning the entire roadway width.

C. Clean the full perimeter on the wall of the steel extrusion.

D. Lubricate the full perimeter on the walls of the steel extrusion cavity before installing the neoprene gland.

3.7 WATERTIGHT INTEGRITY TEST

A. Joint areas must be capable of holding water for 15 minutes without leaking.

B. If joint areas fail the test, remove any leaking seals, clean steel extrusion grooves, and reinstall the seals.

C. Install new seals when leakage persists.

3.8 SEALING

B. Applying protective penetrating concrete sealers (**vinyl toluene acrylic silane polymer**) on concrete header surfaces at expansion joint area according to Special Provision 03381S, “Clear Penetrating Concrete Sealer for Bridges.”

END OF SECTION

June 6, 2003

SPECIAL PROVISION

SP-0040(51)81

SECTION 13592S

ROADWAY WEATHER INFORMATION SYSTEM ENVIRONMENTAL SENSOR STATION (RWIS-ESS)

PART 1 GENERAL

1.1 SECTION INCLUDES

Site Preparation: Install buried conduit per industry standard and associated junction boxes with grounding rods, steel tower base, concrete service pad, concrete tower base foundation and fence installation per design plans or as directed by UDOT representative.

1.2 RELATED SECTIONS

A. Section 02324 : Compaction

B. Section 02330 : Embankment

C. Section 02776: Concrete Sidewalk, Median Filler, and Flatwork.

D. Section 02821: Chain Link Fencing and Gates

E. Section 03055: Portland Cement Concrete.

F. Section 03211: Reinforcing Steel and Welded Wire.

G. Section 03310: Structural Concrete.

H. Section 13553: ATMS Conduit

I. Section 13554: Polymer Concrete Junction Box

1.3 REFERENCES

A. NEC 250-1: National Electric Code

PART 2 PRODUCTS

2.1 POWER

A. Use electrical components as listed and defined by the National Electric Code (NEC).

B. Supply and install conduit, ground rods and junction boxes. Install in each conduit a detectable pull tape with (one foot) incremental measurement markings. Tensile strength will be 1200 ft lb.

2.2 CONCRETE TOWER BASE FOUNDATION AND SERVICE PAD

A. Use Class AA (AE) concrete per Section 03055.

2.3 GROUNDING SYSTEM

A. Wire - use 32 strand, #210 weight, 7/16 inch tinned copper ground cable. For all three legs, start from the outside ground rod clamp wire and run wire to the ground rod three feet from the tower. Clamp the wire to the ground rod. **DO NOT cut the wire.** Then, run the wire across the top of the concrete pad to the corner of the RWIS tower. Leave enough wire to reach the tower foundation plus an additional 10 feet. UDOT will attach the wire to the tower.

B. Ground Rod - use ½ inch diameter 10-foot copper clad. Two per corner, one 3 feet away and one 10 feet away.

2.4 ENVIRONMENTAL SENSORS, REMOTE PROCESSING UNIT, COMMUNICATION EQUIPMENT, AND TOWER

A. To be installed by Department.

2.5 FENCE AND GATE

A. Install as per UDOT specifications.

PART 3 EXECUTION

3.1 GENERAL

A. Conform to the requirements of the National Electric Code (NEC).

B. Tower site location and pavement sensor placement must be approved on site by the UDOT ITS Engineer at (801) 887-3744 or designee prior to construction.

C. Provide a preliminary installation schedule to the UDOT ITS Engineer specified in Part 3.1.B and UDOT Resident Engineer 30 days prior to start of work. UDOT will install pavement sensors. The contractor will provide traffic control for this and will coordinate with UDOT for date of installation,

D. Pick up State-furnished materials at the following:
Utah Department of Transportation
Traffic Operations Center (TOC)
2060 South 2760 West
Salt Lake City, Utah 84104-4592

E. Contact UDOT ITS Engineer at (801) 887-3744, seven calendar days before pick-up date.

F. Install all State-furnished materials per manufacturer's instructions, unless noted otherwise in these provisions or applicable plans.

3.2 TOWER BASE FOUNDATION AND TOWER

A. Follow Sections 03055 and 03211.

B. Provide all necessary grading for a flat and level site.

C. Finish all surface concrete with Ordinary Surface Finish per Section 03310.

D. Place the concrete directly into the excavation. Use minimum forming above ground.

E. Tower to be installed by others.

F. Pick up and install steel tower base section.

3.3 PAVEMENT SENSORS

A. To be installed by UDOT using the Contractor's traffic control.

3.4 SERVICE PAD

A. Install concrete service pad per Section 02776.

3.5 FENCE AND GATE

A. Orient fence gate, and size the fence dimensions per UDOT requirements and drawings.

END OF SECTION